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United States  
Department of  
Agriculture

Forest  
Service

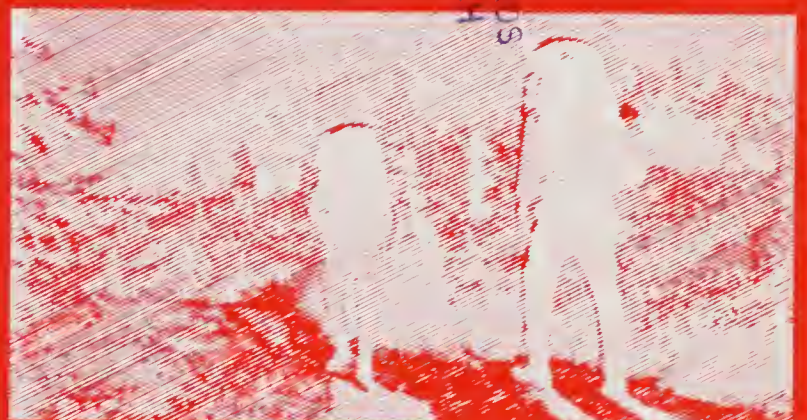
Washington, D.C.



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# Report of the Forest Service

Fiscal Year 1985



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## **The Forest Service**

The Forest Service, U.S. Department of Agriculture, is responsible for Federal leadership in forestry. It carries out this role through four main activities:

- Protection and management of resources on 191 million acres of National Forest System lands.
- Cooperation with State and local governments, forest industries, and private landowners to help protect and manage non-Federal forest and associated range and watershed lands.
- Research on all aspects of forestry, rangeland management, and forest resources utilization.
- Participation with other agencies in human resource and community assistance programs to improve living conditions in rural areas.

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## **Chief**

12th and Independence Ave., SW  
P.O. Box 2417  
Washington, D.C. 20013

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## **National Forest System**

### **Northern Region**

Federal Bldg.  
P.O. Box 7669  
Missoula, MT 59807

### **Rocky Mountain Region**

11177 West 8th Ave.  
P.O. Box 25127  
Lakewood, CO 80225

### **Southwestern Region**

Federal Bldg.  
517 Gold Ave. SW.  
Albuquerque, NM 87102

### **Intermountain Region**

Federal Bldg.  
324 25th St.  
Ogden, UT 84401

### **Pacific Southwest Region**

630 Sansome St.  
San Francisco, CA 94111

### **Pacific Northwest Region**

319 SW Pine St.  
P.O. Box 3623  
Portland, OR 97208

### **Southern Region**

1720 Peachtree Rd., NW.  
Atlanta, GA 30367

### **Eastern Region**

310 West Wisconsin Ave.  
Milwaukee, WI 53203

### **Alaska Region**

Federal Office Bldg.  
P.O. Box 1628  
Juneau, AK 99802

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## **Forestry Research**

### **Intermountain Forest and Range Experiment Station**

507 25th St.  
Ogden, UT 84401

### **North Central Forest Experiment Station**

1992 Folwell Ave.  
St. Paul, MN 55108

### **Northeastern Forest Experiment Station**

370 Reed Rd.  
Broomall, PA 19008

### **Pacific Northwest Forest and Range Experiment Station**

P.O. Box 3890  
Portland, OR 97208

### **Pacific Southwest Forest and Range Experiment Station**

1960 Addison St.  
P.O. Box 245  
Berkeley, CA 94701

### **Rocky Mountain Forest and Range Experiment Station**

240 West Prospect Ave.  
Fort Collins, CO 80526

### **Southeastern Forest Experiment Station**

200 Weaver Blvd.  
Asheville, NC 28804

### **Southern Forest Experiment Station**

T-10210 U.S. Postal Service Bldg.  
701 Loyola Ave.  
New Orleans, LA 70113

### **Forest Products Laboratory**

Gifford Pinchot Dr.  
P.O. Box 5130  
Madison, WI 53705

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## **State and Private Forestry**

State and Private Forestry offices are located in the Regional Headquarters, except for the Eastern Region. This S&PF office is at:

### **Northeastern Area—S&PF**

370 Reed Rd.  
Broomall, PA 19008

United States  
Department of  
Agriculture

**Forest  
Service**

February 1986

# Report of the Forest Service

Fiscal Year 1985



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# THE CHIEF'S MESSAGE

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I am pleased to transmit the Report of the Forest Service for fiscal year 1985. The Forest Service is responsible for managing the National Forests and National Grasslands, providing technical and financial assistance to State and Private organizations and individuals, and conducting forestry research to meet future domestic and international needs.

The next few years will be a challenging time when many efforts that we have been working on for years will come to fruition. Eight of the nine regional land management planning guides--mandated in the 1976 National Forest Management Act--are complete. More than half of the National Forest land and resource management plans have been completed in draft form and 23 are final. And we are involved in the largest proposed Federal lands transaction in the contiguous 48 States in the history of the Forest Service--an extensive interchange of management responsibility for land and minerals with the Bureau of Land Management.

These and other changes are significant, but we must keep them in perspective. I think it is all too easy to get wrapped up in the processes--especially legally mandated processes--and lose sight of our mission. For us, the "bottom line" is caring for the land and serving people.

The severe fire season this Nation experienced in 1985 required cooperation between Federal and State fire organizations, and the professionalism and dedication of everyone involved were outstanding. Record-setting interagency mobilization of personnel and equipment was required to fight the fires, which began in December 1984 in the Southeast. Firefighters were involved in suppression for 10 consecutive months before rain fell in the West in late October. During one period in July 20,000

people, who had been trained and mobilized by the Forest Service and other Federal and State agencies, were engaged in the fire fighting effort.

In forestry research, the Forest Service, as part of the National Acid Precipitation Assessment Program, began a program to determine the extent and location of forest conditions that might be related to atmospheric deposition and to determine the role of atmospheric deposition in influencing the condition of the Nation's forests. The program is jointly planned, managed, and funded by the Forest Service, EPA, and forest industries. The Forest Service and EPA signed an interagency agreement specifying details for jointly managing the program.

In 1985, we continued our commitment to providing the public with quality service while increasing efficiency in administrative and program-support areas. One of the important new projects to be completed in 1985 was the National Information Requirements Project. For this effort we defined the minimum recurrent information needs of the Washington Office and reduced the information processing burden on the field so they can spend more time caring for the land and serving people. Other ongoing management improvement initiatives were combined into a Bias for Action plan to focus attention on the total productivity/efficiency effort.

Cooperation among Federal, State and local agencies became even more essential because of limited resources at each level to protect and manage natural resources. The resurgence of individual volunteer efforts continued in 1985, as more than 40,000 volunteers helped us do a wide variety of jobs.

The following pages will more fully describe the activities and accomplishments of the Forest Service in 1985. We had a very productive, but challenging year. We met or exceeded most of our targets. In doing so, we returned over \$1.13 billion in revenues to the U.S. Treasury, most of which came from the sale of timber resources on the National Forests. As in the past, we will continue to seek innovative ways to have balanced resource use and to demonstrate this balance in our on-the-ground programs.



R. MAX PETERSON  
Chief



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1/ Includes cooperative law enforcement.



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# THE INTRODUCTION

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## **THE FOREST SERVICE—WHAT IT IS AND WHAT IT DOES**

The Forest Service provides national leadership in forestry on all lands, and manages all National Forest System land, about one-third of the Nation's total land. The Forest Service programs, policies, and activities reflect both environmental protection and public needs, which are identified through the public involvement process. The guiding principle for use of the National Forest System land is "the greatest good to the greatest number in the long run." Because the Forest Service is highly decentralized, most day-to-day decisions are made at the local level. The Agency's major jobs include:

### **Managing the National Forests and Grasslands**

The Forest Service manages 191 million acres of public lands (consisting of 156 National Forests, 19 National Grasslands, and 16 Land Utilization Projects) located in 45 States, Puerto Rico, and the Virgin Islands. Its activities on these lands include selling timber, enhancing fish and wildlife habitats, managing recreation sites, identifying property boundaries, building and maintaining roads and trails, protection and fighting fires, monitoring water quality, insect and disease protection, and managing grazing lands.

### **Cooperative Forestry**

The Forest Service cooperates with the States and territories, local governments, forest industries, and private landowners to promote good forestry and land stewardship practices on non-Federal forest lands and to increase efficient wood use. Most technical and financial assistance is provided through State forestry

organizations for a varied mix of projects such as controlling tree diseases, insects, and rodent pests; producing improved seedlings; reducing soil erosion; planting trees to conserve energy; reforesting harvested or burned-over lands; improving timber stands; protecting against fire; and developing fish and wildlife habitats.

### **Forest Research**

The Forest Service research organization provides leadership in forest and rangeland research throughout the United States. Forest Service researchers study the biological, physical, and social sciences, often cooperating with forestry schools and agricultural experiment stations. This research includes in part developing disease-resistant seedlings, mapping lightning fires, atmospheric deposition research, controlling forest pests, and improving wood processing efficiencies. Research results are made available through publications, films, workshops, computer programs, and other methods.

The Forest Service also represents the U.S. in most world forestry matters. In cooperation with the Department of State and the Food and Agriculture Organization (FAO) of the United Nations, the Forest Service provides technical assistance to other countries to help solve their forestry-related problems.

### **Human Resource Development**

Since the Civilian Conservation Corps of the 1930s, the Forest Service has participated in many human resource programs aimed at putting people to work and improving living conditions in rural areas.

## **FOREST AND RANGELAND RENEWABLE RESOURCES PLANNING ACT (RPA)**

### **Overview of RPA**

The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended, directs the Secretary of Agriculture to prepare a comprehensive, long-range assessment of the Nation's renewable resources and to develop a program for Forest Service activities.

The most recent Assessment was completed in 1979 and supplemented in 1984 to account for significant changes that have occurred since 1979. Currently, work is being completed on the most recent RPA Program, covering 1986 to 2030. When approved, this Program will be transmitted to Congress.

### **Annual Report to Congress**

The RPA also requires the Secretary to submit an annual report to Congress on Forest Service accomplishments and progress in carrying out the RPA Program. This report covers fiscal year 1985 <sup>2/</sup>.

Required in the Annual Report are the following:

- A description of the status of major research programs, significant findings, and ways these findings will be applied in programs.
- A description of the cooperative forestry assistance programs, and their accomplishments, status, needs, and work backlogs.

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<sup>2/</sup> Unless otherwise stated, all references to years in this report are fiscal years.

- A report on the progress of incorporating mandated standards and guidelines into the land management plans for units of the National Forest System.
- A summary of estimated expenditures—on a representative sample basis, for reforestation, timber stand improvement, and the sale of timber from the National Forest System—compared to the return to the Government from such timber sales.
- An identification, on a representative sample basis, of advertised timber sales made below the estimated expenditures mentioned above.

This document includes other reports that Congress requires at the time of the Annual Report. These are as follows:

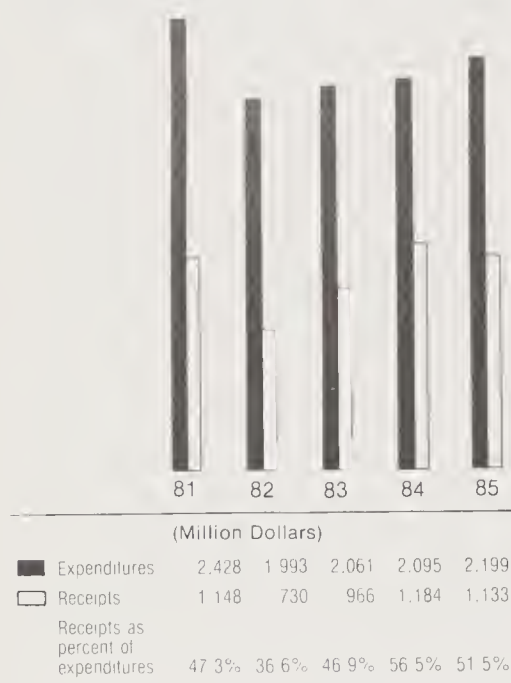
- A report identifying the amount and location, by Forest, State, and productivity class, of (1) all lands in the National Forest System where land management plans have indicated the need to reforest areas that have been cut over or otherwise denuded or deforested, and (2) all lands with stands of trees that are not growing at their best potential.

- An estimate of the funds needed to successfully replant an acreage equal to the acreage to be cut over that year. Also, an estimate of funds needed to reforest enough lands to eliminate the reforestation backlog by the end of 1985.
- A report on the amounts, types, and uses of herbicides and pesticides used in the National Forest System, including the beneficial or adverse effects of such uses.



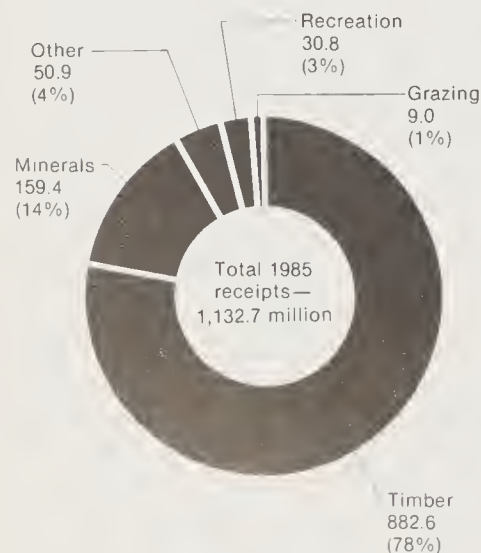
# ADMINISTRATION

## Expenditures and Receipts



## Distribution of Receipts by Program

(Million Dollars)



## INTRODUCTION

The Forest Service is continuing to provide quality service to the public while increasing efficiency in the administrative and program support areas.

One of the more important projects to be completed was the National Information Requirements Project (NIRP), which defines minimum recurrent information needs at the Washington Office and reduces the information processing burden on field units.

Other ongoing management improvement initiatives were combined into a Bias for Action plan to focus attention on the total efficiency/productivity effort. Savings, especially from National Administrative Review and Federal Field Structure Review, will increase in subsequent years.

## RECEIPTS AND EXPENDITURES

The Forest Service receives operating funds from Congress and various cooperator deposits. Receipts are collected from Forest Service operations such as timber sales, grazing and recreation fees, and mineral leases and permits. (Tables 1 through 6).

Receipts for 1985 totaled \$1.13 billion, down 4 percent from last year's \$1.18 billion. Expenditures totaled \$2.20 billion, compared to \$2.09 billion in 1984.

Timber receipts in the form of cash, deposits, and roads in lieu of cash totaled \$883 million, which was 78 percent of total Agency revenue in 1985. Receipts from mineral leases, royalties, sales, and bonus bids were the second largest source of revenue at 14 percent of the total, or \$159 million. Other sources included recreation fees, land use permits, grazing fees, and royalties from the sale of Smokey Bear and Woodsy Owl products.

Managing the National Forest System in 1985 required 84 percent of all Forest Service expenditures. Forest Research spent 6 percent, Human Resource Programs 3 percent, and State and Private

Forestry 3 percent of the budget. Working Capital Fund, used to replace vehicles and heavy equipment, amounted to 4 percent of expenditures.

The Forest Service, as required by law, pays the States 25 percent of all National Forest receipts. These funds are to be used for public schools and roads in counties containing National Forest System lands. In 1985 the Forest Service paid \$224.9 million to the States from money received from National Forests in 1984. In addition, a total of \$10.0 million was paid to counties from National Grasslands and Land Utilization projects receipts from calendar year 1984. Minnesota received \$716,015 under the Boundary Waters Canoe Area Wilderness Act.

## PERSONNEL

Forest Service employees were fewer in number by the end of fiscal year 1985 than in 1984, continuing a trend in reducing employment over the past several years. Peak employment (July) fell from 49,220 to 47,943, predominantly through attrition (table 8). There was also a drop in permanent full-time employment, from 30,030 to 29,211, and a decrease in the permanent "other" category and temporary work force from 3,965 to 3,713, and 15,225 to 15,019, respectively.

The Agency's work force is heavily concentrated in the National Forest System, which employs 93 percent of the employees. Research has 6-1/2 percent, and State and Private Forestry makes up only 1/2 percent.

Of Forest Service employees, 58 percent (27,281) are in technical occupations (table 7); the largest portion of these are forestry technicians. Professional employees are the second largest category, with 10,896 or 23 percent of the Agency's work force. Foresters and civil engineers remain the largest professional occupations in the Forest Service.

## PUBLIC INVOLVEMENT

The Forest Service recognizes that our resource decisions must be shaped by the values and needs of a variety of publics, including commercial forest users, forest-products consumers, recreationists, State and local governments, and local residents affected by Forest Service programs. In an effort to be more responsive to our customers, the public involvement program has grown beyond facilitating the exchange of information between the Forest Service and various publics. It now includes an array of activities such as content analysis, cooperative problem-solving, issues identification and management, and conflict management. All of these activities are designed to elicit informed consensus from our publics for management of the National Forests.

During the past year, the Public Involvement Staff has worked very closely with the Land Management Planning Staff in the areas of cooperative problem-solving and conflict management. Many field units have been successful in dealing with conflict through consensus-building and negotiation. To complement these activities, the Washington Office (WO) has sponsored conflict management training for the past 5 years.

Several hundred Forest Service employees have attended these courses. And, according to a study conducted by The University of Michigan, employees are using the cooperative problem-solving and negotiation techniques taught in the course very successfully.

Also in 1985 we began a study to evaluate the issue identification, public involvement, and conflict resolution aspects of forest planning. The study is sponsored by three WO staffs—Information, Land Management Planning, and Environmental Coordination. Results will be released in the summer of 1986.

In cooperation with the WO Forest Pest Management (FPM) Staff, we

have adopted a system designed by the Institute for Participatory Management, called Citizen Participation by Objectives (CPO), to help us achieve informed consensus for our integrated pest management activities. A three-person team from the WO moved from a study of the system to the first steps of implementation. The team developed a handbook (draft) and gave several progress reports to upper management. The team traveled to the Southwestern Region to assist in installing a CPO program. The team also developed criteria for an extensive field test of the CPO system. The Northern Region will be the site of this field test; and, at the request of the Montana Department of Agriculture, the test will be directed at the problem of noxious weeds.

The FS/BLM Interchange proposal created a high level of public involvement. Nearly 1,000 meetings were held, and we received comments from more than 2,000 people.

Two other major public involvement activities were recreation residence fees (almost 6,000 people commented) and grazing fees (over 7,000 responses were received).

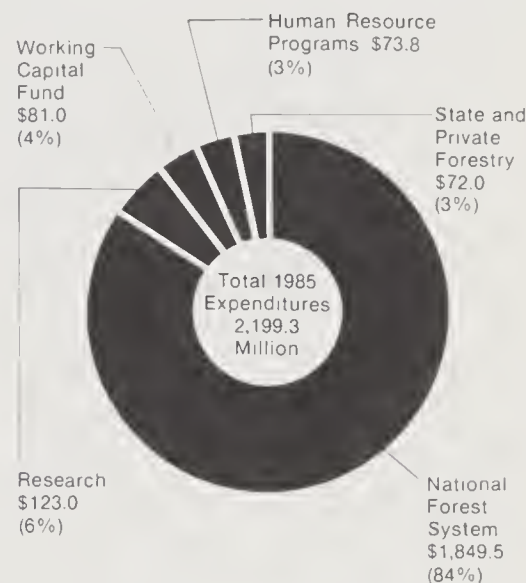
## INFORMATION MANAGEMENT

The Forest Service is in the third year of installing a system of distributed information processing throughout the Agency. Our goal is to provide field offices with common word processing, data processing, and telecommunications capabilities by the end of 1987. Systems are now operating in the Washington Office, all Regional Offices and Research Station headquarters, National Forest and many Ranger District offices. We are already realizing many of the benefits anticipated, including increased productivity and more timely and accurate information.

The study of information requirements at the national level has been completed. This effort

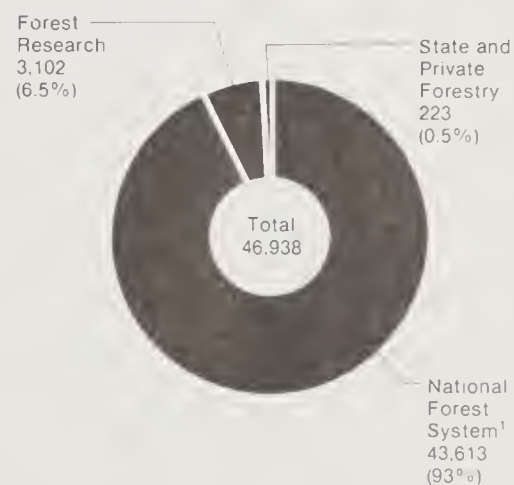
## Distribution of Expenditures by Program Area

(Million Dollars)



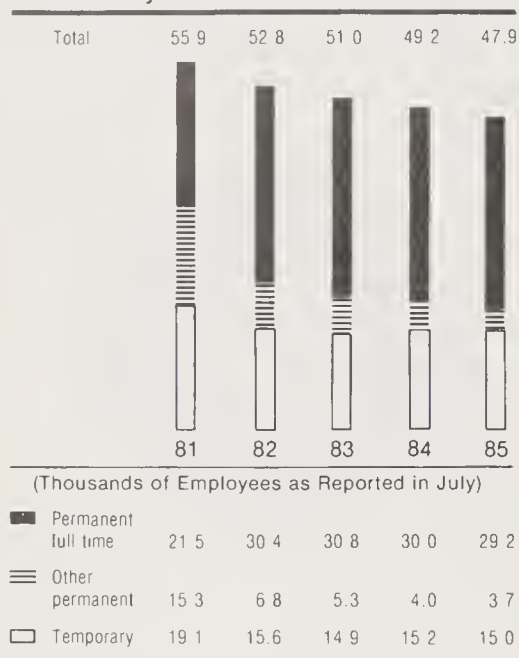
## Distribution of Work Force by Program Area

(Number of Employees as of September 30, 1985)



<sup>1</sup>Includes Office of Information, Programs and Legislation and Administration

**Distribution of Work Force by Tour of Duty**



resulted in more than a 95-percent reduction in the data elements required to formulate a National budget. Over 300 reports were eliminated as a WO requirement, a 60-percent reduction, easing the information burden on field units. There are significant cost and time savings associated with these reductions that will affect the Forest Service for many years.

The Agency also completed a review of its Forest Service Manual with the objective of removing unneeded administrative burdens and increasing the organization's effectiveness. The Manual is now less procedural, specifies greater reliance on the judgment of field personnel, and contains fewer prescriptive requirements. While not designed to reduce the volume, the review did eliminate over half the pages in the Manual.

#### PRODUCTIVITY IMPROVEMENT

During the past few years the Forest Service put a lot of effort into developing and implementing management initiatives aimed at increasing productivity. Examples include Reform '88, Federal Field Structure Review, Productivity Improvement Studies, and a National Systems Management Review. To provide for better management of all these efforts, the Agency developed a Bias for Action document, which is now being used to implement changes and improve accountability.

These actions have already yielded significant savings. In FY 1985, management initiatives and budget cuts achieved cost savings equal to salaries and fringe benefits for about 800 full-time equivalent employees. Six Ranger District Offices were closed. In cities with more than one Forest Service facility, personnel offices and contracting and procurement offices have been combined where shared services proved cost effective. These colocations also result in space savings.

Directly related to this effort was the introduction of a national pilot study to identify opportunities for improving efficiency and effectiveness. Three National Forests and one Research Station were selected to test operations under maximum delegation of authority and managerial discretion.

While there were no new Productivity Improvement Team (PIT) Studies conducted in 1985, previous studies and action plans are still being implemented. With 68 percent of the 274 action plan items completed, estimated annual savings to date were \$7.56 million. Work is still underway on 130 additional items.

During fiscal year 1985, the Forest Service modified its Management Review System to meet the Federal Managers' Financial Integrity Act (FMFIA). The revised system incorporates a vulnerability (risk) assessment process to establish priorities for reviews and to identify controls that are excessive.

#### HUMAN RESOURCE PROGRAMS

The goal of the Forest Service's Human Resource Programs is to provide job opportunities and training for youths, the unemployed, underemployed, economically disadvantaged, and the elderly while carrying out high-priority conservation work. During 1985, \$71.0 million was transferred from the Department of Labor to operate two major programs: Job Corps and the Senior Community Service Employment Program. In addition, the Agency used \$3.2 million of National Forest System funds to operate a Youth Conservation Corps program during the summer. Other programs administered by the Forest Service included the Volunteers in the National Forests and the Touch America Project. Also, the Forest Service provided work opportunities for participants in State and local employment programs.

These programs offered employment and skills training to 71,669 persons during the year. Major accomplishments, valued at \$87.9 million, included campground and trail construction, tree planting, fence building, firefighting, timber stand improvement, clerical support, and construction of office buildings, warehouses, and roads.

### Job Corps

The Job Corps program provides basic education and job training to disadvantaged youths between the ages of 16 and 22.

The Forest Service administers 18 Job Corps Civilian Conservation Centers under an interagency agreement with the Department of Labor. The main purpose of the centers is to enable graduates to find productive work, reenter school, or join the military. In 1985 80 percent of those completing the Job Corps program took one of these career steps.

Funding for the Job Corps program year (July 1, 1984-June 30, 1985) was \$50 million. The 8,664 youths who participated (54 percent minorities) accomplished \$19.1 million worth of work through 3,825 person-years of on-the-job training.

### Senior Community Service Employment Program

The Senior Community Service Employment Program is administered by the Forest Service through an interagency agreement with the Department of Labor. The program, authorized under Title V of the Older Americans Act, is designed to provide (1) part-time employment and supplemental income to the low-income and disadvantaged elderly, (2) training and transition of participants to the regular labor market, and (3) community service to the public.

During the program year (July 1, 1984, to June 30, 1985), 6,202 persons were employed. Of these,



*The Flatwoods Civilian Conservation Center, Jefferson NF, Virginia, was constructed by participants of the Job Corps program.*



*Over 6,000 persons were employed in the Senior Community Service Employment Program in 1985.*

24 percent were minorities and 39 percent were women. Thirteen percent of the participants were later placed in nonsubsidized jobs. The enrollees accomplished 2,833 person-years of work valued at \$33.1 million, returning \$1.58 for each appropriated dollar. Funding for seniors during this program year was \$21 million.

### Youth Conservation Corps

The Youth Conservation Corps (YCC) is a summer employment program for young men and women aged 15 through 18. YCC enrollees earn and learn while doing conservation work on National Forest System land. The Forest Service operated a \$3.2 million program this year. The 2,293 youths who participated (15 percent minorities and 44 percent women) accomplished \$4.5 million worth of work, returning \$1.41 on each dollar invested.

*Enrollees in the Youth Conservation Corps build a sidewalk and retaining wall at the Golconda Civilian Conservation Center, Shawnee NF, Illinois.*



*The volunteers program and the Touch America Project were once again popular programs in 1985--accomplishing over 1,700 person-years of work.*



### Volunteers in the National Forests

The volunteers program offers individuals from all walks of life the opportunity to donate their services to help manage the Nation's natural resources. This program continues to grow in popularity as people realize how they can personally help carry out natural resource programs.

The Touch America Project (TAP) is a special volunteer program that gives young people between the ages of 14 and 17 a chance to gain job experience and environmental awareness while working on public lands. Private sector organizations sponsored 6,690 youths in TAP.

In 1985, the volunteers program and the Touch America Project attracted 45,907 participants, who contributed 1,787 person-years of work valued at approximately \$22.5 million.

### Hosted Programs

The Forest Service provides conservation work opportunities for participants in programs administered primarily by State and local governments. Hosted programs include the Job Training Partnership Act, college work study, vocational work study, and work incentive. During 1985, 8,603 people participated in these programs, accomplishing 741 person-years of work valued at \$8.7 million.



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# NATIONAL FOREST SYSTEM

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## INTRODUCTION

The Forest Service manages and protects 191 million acres of National Forest System (NFS) land, 87 percent of which are in the Western United States.

The natural resources on these lands are among the Nation's greatest assets. How these resources are used and protected affects the economic, environmental, and social well-being of every citizen. Renewable resources such as recreation opportunities, forage, wood, wilderness, wildlife, fish, and water are products of the National Forests. Nonrenewable resources such as oil, gas, coal, sand, gravel and hardrock minerals are also produced.

Funded targets for 1985 have been met or exceeded in most cases. Tables 10 through 13 show the percentages of accomplishments and funding. Discussions of key activities, outputs, and other program information follow.

## LAND MANAGEMENT PLANNING

### The Planning Process

The Forest Service uses the land management planning process to determine the best use of all resources on NFS land, including recreation, fish and wildlife habitat, water, timber, minerals, range, and wilderness. The process not only helps managers determine the best use of these resources but helps them schedule such use so that adequate supplies are always available.

As part of the planning process, regional guides were developed by each of the nine Forest Service Regions. Managers on individual Forests are using the guides in developing forest plans. These forest plans describe how all resources on that Forest are to be managed, the benefits derived

from management, how much management will cost, and what the environmental impact of planned activities will be.

Land management planning is a continuing process that responds to changes in the demands made upon the supply of renewable resources. The Forest Service, in cooperation with the public, will update and amend forest plans as needed to ensure that adequate resources will be available for future generations.

The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA), requires the Secretary of Agriculture to develop an integrated land and resource management plan for each administrative unit of the National Forest System. To implement the requirements of the NFMA, regulations were developed to guide land and resource management planning on 191 million acres of the National Forest System. The regulations require integrated planning for all resources.

The NFMA regulations were revised in 1983 in response to a court decision that found the 1979 Roadless Area Review and Evaluation (RARE II) environmental impact statement and associated procedures to be inadequate under the National Environmental Policy Act (NEPA). This latest revision mandates that the forest planning process reevaluate areas that remain essentially roadless and undeveloped and have not been designated by law as wilderness or for nonwilderness uses. This revision became effective October 7, 1983.

### Regional Guides

All nine final regional guides and environmental impact statements required by NFMA have been published.

The primary purpose of these guides is to provide national and regional direction in the development of forest plans. Included in the guides are major issues and management concerns of the Region as well as tentative resource objectives, recommended by RPA, for each National Forest. While the guide ensures that a consistent approach to National Forest planning is followed throughout the Region, it allows management on the individual Forests considerable latitude in formulating forest plans. The guide also helps coordinate NFS programs in the Regions with programs in State and Private Forestry and Research.

### Status of Forest Plans

Of the 123 Forest plans to be developed under the NFMA, 23 final and 67 draft Forest plans have been filed with EPA or approved for publication.

Table 14 lists the draft and final Forest plan environmental impact statements (EIS's).

### Status of Appeals

In FY 1985, 50 appeals were filed on 23 Forest plans, of which 30 appeals were resolved through the land management planning process. Five Forest plans were cleared of all appeals in fiscal year 1985. There are no appeals delaying implementation of the Forest plans.

The Pacific Northwest Regional Guide is the only Regional Guide that has been appealed. The Guide was remanded by the Secretary's office, requiring additional analysis and preparation of a supplement to the Guide to determine the amount of old-growth timber that must be protected to assure viability of the northern spotted owl.

Draft Forest plans, where spotted owl is a significant issue, will not

be released to the public until the spotted owl evaluation is completed.

### Wilderness Legislation

At the beginning of calendar year 1985 there were 32.1 million acres of wilderness in the National Forest System (Table 39). Another 21.6 million acres of roadless areas are being reviewed for their wilderness potential. The latter figure includes congressionally mandated wilderness studies on about 6 million acres in 26 States.

At the end of December, 12 wilderness bills were before the Congress, covering 5,366,440 acres in 6 States. One new wilderness area in Kentucky was designated by Congress covering 13,300 acres.

### Wild and Scenic Rivers

The Forest Service completed four Wild and Scenic River (WSR) study reports that the President subsequently transmitted to the Congress. The President recommended three for inclusion in the National Wild and Scenic Rivers System: the North Fork Kern in California (60.7 miles), the Manistee in Michigan (51 Miles), and the Cache la Poudre in Colorado (83 miles). The Situk in Alaska was recommended for nondesignation.

Several other river study reports are in various stages of completion: Sipsey Fork in Alabama, Black Creek in Mississippi, Red River in Kentucky, Greenbrier in West Virginia, Allegheny in Pennsylvania, Horsepasture in North Carolina, and North Umpqua in Oregon.

Through the land management planning process, the National Forests are also evaluating the eligibility of about 500 rivers in the National Rivers Inventory that flow through National Forest lands, and other rivers that were not included in that inventory. Some National Forests will make WSR suitability determination in the Forest plans, while others will recommend future study.

## MINERALS

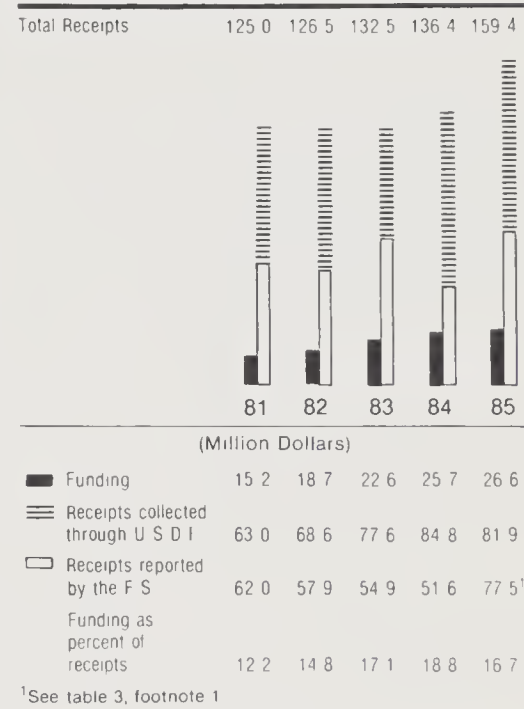
Energy-producing resources found beneath NFS lands are oil, natural gas, coal, geothermal steam, and uranium. Minerals of strategic importance beneath NFS lands include chromium, nickel, tungsten, and molybdenum. Gold, copper, zinc, silver, and phosphate are also found in significant amounts.

Forest Service minerals management ensures that the mineral resource is developed in a manner compatible with the management of other resources. The Agency cooperates with the Department of the Interior, primarily the Bureau of Land Management, which is responsible for administering subsurface energy and mineral resources on all Federal lands. The Forest Service is required to prepare EIS's where exploration, development, and production of mineral resources will significantly affect the environment.

Nearly 28,500 mineral cases were processed in 1985, exceeding the 1985 RPA goal by 19 percent, and the funded target by 28 percent (Table 15). These cases involved leasable, locatable, and common variety minerals. They included such activities as processing new lease applications, completing validity examinations, processing prospecting permits, administering operating plans, and working on reserved and outstanding minerals rights.

More minerals cases were submitted than were anticipated for fiscal year 1985. Although accomplishments exceeded the RPA and funded targets, the number of cases remaining unprocessed at the end of the year increased from 2,805 in 1984 to an estimated 3,533 in 1985 (Table 16). This increase in mineral activity on NFS lands is the private sector's response to the Nation's growing mineral demands. New developments help to reduce dependence on uncertain foreign supply sources.

## Minerals—Funding and Receipts



*Reclamation efforts - Before*



*Reclamation efforts - After*



Of the unprocessed cases, 1,215 or 34 percent were cases in areas where the Forest Service is precluded from acting upon them. In particular, these include areas being considered for wilderness and restricted under the Appropriations Act or where wilderness studies are not yet complete.

In 1985, total receipts from rents, royalties, sales, and bonus bids for minerals totaled an estimated \$159.4 million. The total includes \$19 million due to adjusted windfall profit tax payments for fiscal year 1980 to fiscal year 1984. Without this adjustment, total receipts of \$140.4 million are slightly higher than last year in terms of actual dollars.

Program costs have increased in recent years, compared to the receipts generated. Only a small part of the fiscal year 1985 receipts are the direct result of program activities conducted in the same year. An estimated 90 percent of the fiscal year 1985 receipts result from work done in prior years. Similarly, much of the program conducted during fiscal year 1985 will lead to receipts in future years. The costs-receipts relationship has also been influenced by increased costs associated with resource coordination activities and a cyclical downturn in many mineral markets.

## LANDS

### Land Exchange Program

Land exchanges are carried out primarily to reduce the cost or improve the effectiveness of resource management. In 1985, 118,996 acres of non-Federal land were acquired in exchange for 80,229 acres of NFS land. This was over 100 percent of the land scheduled for exchange in the 1985 funded program. Actual unit costs of \$55 per non-Federal acre acquired were slightly lower than anticipated costs.

These exchanges consolidated NFS lands, making it more efficient to manage and administer various resource programs. National Forest property lines were reduced by more than 1,530 miles. This provides an estimated savings of about \$8.5 million in future landline location costs, and exceeds the \$6.5 million cost of the exchange work. Additional savings will result from fewer trespass cases, fewer special-use permits, and fewer rights-of-way cases.

Most of the non-Federal land acquired through land exchanges is within classified Wilderness Areas, National Recreation Areas, Wild and Scenic Rivers, National Trails, and other congressionally designated areas. In each case, it proved more cost effective to exchange lands than to purchase them. Non-Federal landowners paid \$1,204,700 in cash equalization payments and the United States paid \$39,700. The total amount (\$1,244,400) was 2 percent of the appraised value, well within the 25 percent allowed by the Federal Land Policy and Management Act.

### Landline Location

Landlines--the legal boundaries between NFS lands and other ownerships--must be identified so that activities (e.g., timber sales) can be carried out without risk of trespass.

Accurate location of Forest Service property lines is essential to managing and protecting NFS lands from encroachment. The RPA goal is to locate, mark, and post all NFS property boundaries by the year 2020. Of the total 272,409 miles of property boundary, 75,346 miles were completed by the end of 1985.

In 1985, \$29.1 million was appropriated to locate about 5,402 miles of property boundaries and maintain 2,083 miles of established property boundaries. A total of 5,945 miles was located, 10 percent more than the target. Property boundaries maintained totaled 2,616 miles, exceeding the target by 26 percent. The Forest Service was able to exceed targets in 1985 primarily because of efficiencies gained through advancement in technology and procedure.

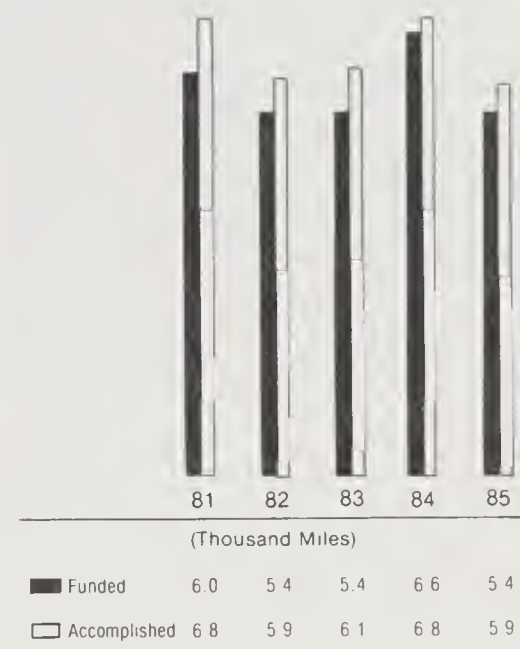
### Small Tracts Act Cases

The Small Tracts Act of 1983 authorizes the Secretary of Agriculture to sell or exchange small parcels of NFS land. Included are unmanageable parcels of various sizes and shapes located between mineral patents and small parcels innocently occupied (e.g., where a private home has been built over an NFS property line inadvertently). Since February 1984, when regulations to implement the act became effective, 258 cases, most involving encroachments, have been resolved. In all, 249 acres of Federal land have been disposed of, 88 acres of non-Federal land have been acquired, and \$279,500 has been paid to the United States. Of the 258 cases resolved since the inception of the act, 75 percent were resolved in 1985.

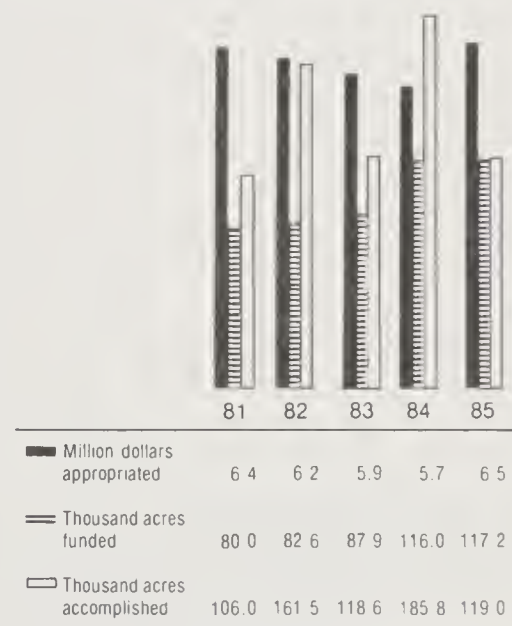
### Land Purchase and Donations

The Forest Service purchased 34,910 acres of land and interests in land with money provided by the Land and Water Conservation Fund and Receipts Acts appropriations. In addition, landowners donated 11,946 acres of land and interest in land to the National Forest System.

### Landline Location



### Land Exchange-Funding and Accomplishment



NUMBER OF DETECTED WILDFIRES  
\*\*\*\*\*

Year	Lightning- caused	Person- caused	Total	Acres Burned
'80-84 (5-yr. avg.)	4,611	5,223	9,834	154,058
'85	5,990	6,010	12,000	663,756

## PROTECTION

### Fire Management

The 1985 fire season, the worst since 1934, required record-setting interagency mobilization of personnel and equipment. Person-caused and lightning-caused fire activity, aggravated by continued drought, began in December, 1984, in the Southeast. Forest Service assistance to the States began in January, when devastating fires prompted the Governor of Florida to declare a state of emergency. In June, seven national interagency fire-suppression teams were committed to Florida, the most ever in the Southeast.

Meanwhile, Colorado and South Dakota also had major fires, soon followed by California. By mid-June, extreme fire activity had spread from California into Oregon and the Great Basin. During the height of the fire season, from mid-June through August, a record number of major fires burned in the Western States.

The overall fire situation required a massive response from all parts of the country. The National Interagency Fire Coordination Center moved more people and other resources over a broader geographical area in a shorter period of time than ever before in its 20-year history. More than 17,000 fire fighters were mobilized at one time from all cooperating agencies.

Major Forest Service fires included the Wheeler, Gorda-Rat, and Las Pilitas fires, which consumed 118,000, 56,000 and 75,000 acres, respectively, on the Los Padres National Forest in California. In Idaho, the Long Tom complex, including the Savage Creek and French Creek fires, burned 55,240 acres of National Forest lands.

All 37 contract airtankers were committed, as well as five add-on airtankers and eight military C-130's equipped with Modular Airborne Fire Fighting Systems (MAFFS). In addition, large charter, contract, and military air transports flew an unprecedented number of flights.

In early August an unusually intense fire season occurred in Alaska. Firefighting resources were flown from the lower 48 to combat Alaskan fires. By late August, activity moderated in Alaska but continued in the lower 48 until September rains provided some relief.

California, Oregon, and Washington continued to experience fall fires associated with east winds, and the 1985 fire season was not over until general rain fell in late October. By this time, fire fighters had been involved in suppression for 10 consecutive months.

*Mop up was critical during 1985 due to extremely dry conditions. Flathead NF, Montana.*



## **Fuel Management**

The purpose of fuel management is to (1) reduce the volume of naturally combustible material on the forest floor and thus minimize the potential for large, destructive wildfires; and (2) support land and resource management objectives. Activities include surveying fuel hazards, analyzing alternatives for treating these hazards, and fuels.

Due to favorable prescribed burning conditions, the Agency was able to treat 116 percent of the acreage planned for 1985.

## **Insects and Diseases**

Resource damage caused by pests can be effectively reduced by applying pest control principles to resource management activities. Forest plans now being prepared will project potential forest pest outbreaks, estimate damage, and plan appropriate management actions.

Major NFS pest management accomplishments beyond those realized through regular forest management activities are:

- Detection and evaluation.....107 million acres
- Prevention/suppression.....239 thousand acres

A more detailed discussion of forest pest management is included on pages 34 and 36.

## **Law Enforcement**

Forest Service responsibility for law enforcement is directed at protecting natural resources, Federal property, employees, and visitors on the National Forests. Major law enforcement investigative activities in 1985 included the areas of wildland arson, timber theft, marijuana eradication, internal investigations, theft of artifacts, and destruction of archaeological sites.

During 1985, the Forest Service participated in the California Governor's interagency task force



*Prescribed fire underway on Lolo NF, Montana.*

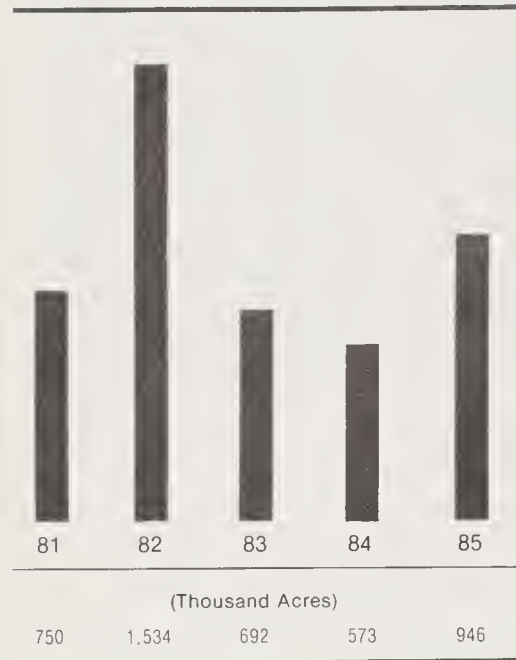
on arson. This assistance developed into a multiagency arson investigative program which includes the utilization of a computer system for consolidation of information on fire. Some of the information includes mode of operations, suspects, and patterns. The program also includes multiagency strike teams to investigate arson and to conduct training courses on wildland arson investigation.

During 1985, the Forest Service further strengthened relationships with the Federal Drug Enforcement Administration (DEA), U.S. Department of Justice, and State and local law enforcement agencies responsible for investigating Cannabis cultivation on the National Forests.



*A Forest Service criminal investigator inspects pottery recovered during an active archeological artifact theft investigation.*

Acres Significantly Impacted by Cannabis Cultivation



The major concern related to Cannabis is the risk to National Forest visitors, contractors, and Forest Service employees when they encounter those who are tending and/or guarding these lucrative crops. Reducing the use of the National Forests for Cannabis production is essential in maintaining a safe environment for all users of the National Forest System.

The Forest Service continued its long-term commitment to standardized, high-quality law enforcement training at the Federal Law Enforcement Training Center (FLETC) this year. The Forest Service cooperates with the Department of the Treasury in many activities at the Center. For example, specialized interagency courses in investigation of incendiary fires and vandalism of archaeological sites were presented to 10 agencies in 1985. In addition, a total of 210 employees graduated from the "Criminal Investigation" and "Law Enforcement for Land Management Agencies" courses. The Forest Service shares three instructor positions at the center to assist in the planning and implementation of interagency courses. The Forest Service also conducted at FLETC a special law enforcement course for line managers.

The loss of cultural resources to vandalism, pothunting, illegal digging, and theft is of great concern in many parts of the country. The Forest Service has been investigating and prosecuting pothunting cases since the mid-1970's. Since passage of the Archaeological Resources Protection Act (ARPA) in 1979, Forest Service special agents and law enforcement officers have been directly involved with many convictions under ARPA in several States. Last year alone, over 3,000 citations were issued for violations of cultural resources laws and regulations, and 48 arrests were made in more serious incidents.

## TIMBER

### Program Overview

A significant portion of the timber on National Forest System lands is managed to produce a continuous supply of wood products to help meet America's needs. The products of the National Forest timber resource include logs for lumber and plywood, wood fiber for paper, fuelwood, posts, poles, and Christmas trees.

National Forests have the largest supply of standing softwood sawtimber in the Nation, estimated at nearly 1.1 trillion board feet. This is about 41 percent of the national total; nonindustrial private forest land accounts for 33 percent of the total, private industry has 15 percent, and other public lands have 11 percent.

National Forests provide about 20 percent of the total sawtimber harvested in the United States annually. This compares to about 40 percent from nonindustrial private forest lands, 30 percent from lands owned by the forest industry, and 10 percent from other public lands.

Accomplishments for the three major timber program components in relation to 1985 targets were 103 percent for timber offered for sale, 98 percent for reforestation, and 120 percent for timber stand improvement (TSI).

Accomplishments in comparison with the goals established in the 1980 RPA program were: 92 percent for timber offered, 79 percent for reforestation, and 103 percent for timber stand improvement.



A log loader used on a timber sale on the Eldorado NF, California.

The timber industry continues to recover from the near-depression economic conditions that began in 1980 and continued through mid-1983. These conditions resulted in an increased level of bankruptcy filings, defaulted timber sales, and uncut timber volume under contract, all of which required extraordinary steps to be taken by both the Forest Service and Congress.

### **Demand in 1985**

Demand for timber products in the United States rose slightly from 1984 levels. The increase in demand for timber products was reflected in the increased harvest of National Forest timber, with cuttings at the highest level since 1974.

### **Timber Sale Preparation, Offer, and Harvest**

In order to be responsive to market demands now and in the future, Congress provided the Forest Service with a goal to prepare 11.4 billion board feet and to offer for sale 11.2 billion board feet of timber in 1985. A total of 11.7 billion board feet were prepared, 11.5 billion board feet were offered, and 10.8 billion board feet were sold.

The value of timber sold was \$558 million. These figures compare to 1984 sales of 10.7 billion board feet valued at \$699 million. The average bid for timber in 1985 was slightly under \$52 per thousand board feet. This compares with \$66 in 1984, \$70 in 1983, and \$61 in 1982 (table 21).

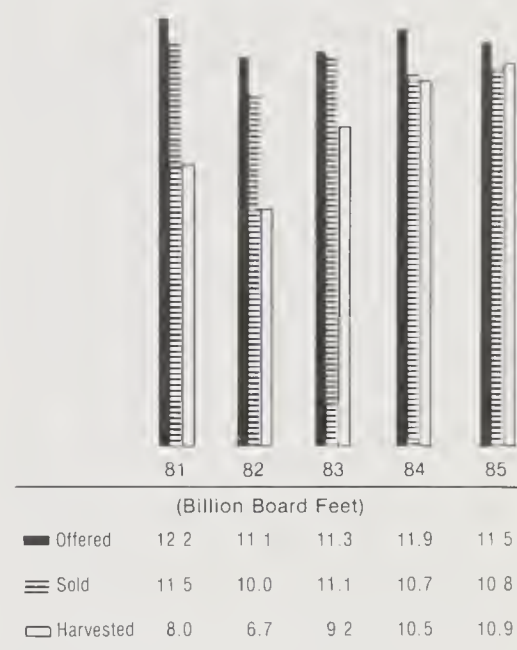
There are many reasons for the continued reduction in average bid: high industry inventory carryover, lower priced Canadian lumber on the market, new timber sale procedures introduced in 1983 that make it more costly for purchasers to hold large volumes of uncut timber under contract, and uncertainty as to the final determination of the Federal Timber Contract Payment Modification Act of 1984.

As in 1984, sales were small in volume and contract periods were short in order to give the industry opportunities to respond to current market situations. The cost per thousand board feet to prepare and administer timber sales did not increase between 1984 and 1985. In 1985, harvest volume totaled 10.9 billion board feet, compared to 10.5 billion board feet in 1984. Value of timber harvested was \$720 million in 1985, compared to \$760 million in 1984.

Uncut volume under contract increased slightly to 38.3 billion board feet in 1985, compared to 37.9 billion board feet in 1984. In December 1983, the Forest Service implemented a 5-year contract extension program. Sales scheduled to expire in 1984 were extended and added to the volume under contract. The value of this 38.3 billion board feet is estimated to be about \$6.5 billion at current market rates.

Readers will note (table 26) that the volume under contract in 1985 does not equal (volume under contract in 1985 + volume sold in 1984) less (volume harvested in

### **Timber Offered, Sold, and Harvested**

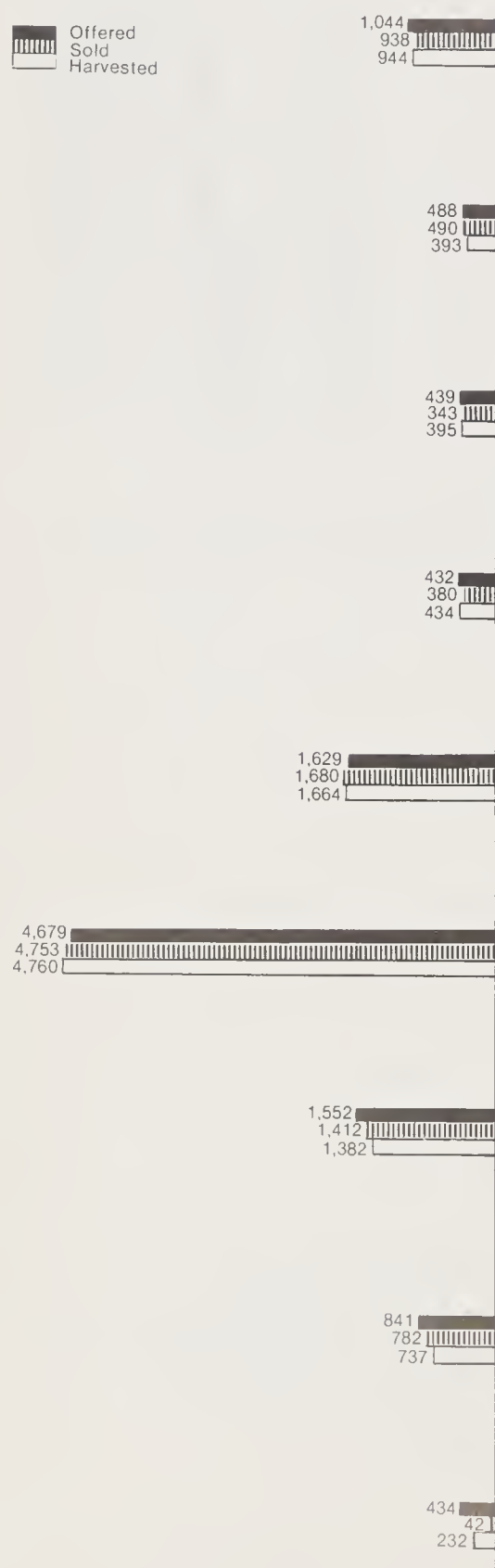


*An Australian brushrake cleans up brush and debris after a timber sale. The brush is raked into windrows that are burned or left for wildlife habitat. Chequamegon NF, Wisconsin.*

Timber Offered, Sold and Harvested

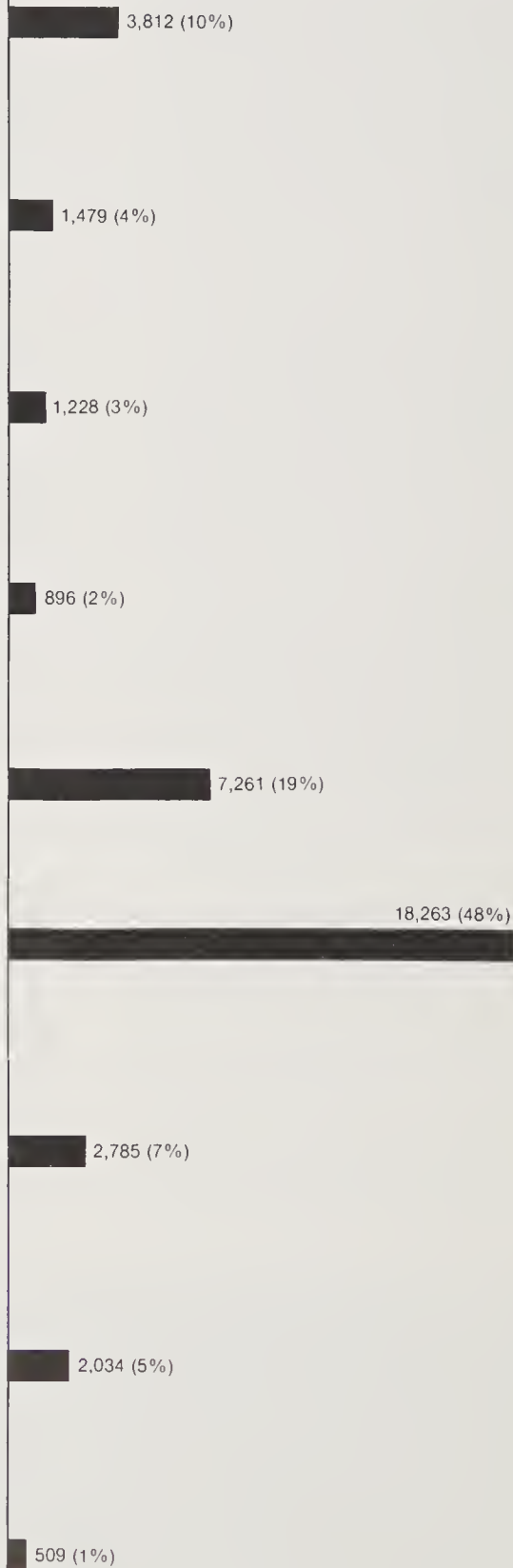
(Million Board Feet)

Offered  
Sold  
Harvested



Uncut Timber Volume Under Contract

(Million Board Feet)



Total uncut timber under contract — 38,267 million board feet

1985). The original volumes sold may differ from volumes harvested because of volume adjustments during sale life and variation in volume estimates. This year's report of volume sold and harvested is based on data from the Servicewide Timber Statement of Account. Therefore, volume under contract now includes sales conditionally extended under the multisale extension plan as well as volume from unresolved defaulted sales. Long-term sales in Regions 3, 4, 9, and 10 are not included in the volume sold, but are credited on harvest as it occurs. In addition, status of some sales remains unresolved due to Title 7 bankruptcy proceedings.

In October 1984, Congress passed the Federal Timber Contract Payment Modification Act. This act provides an opportunity for many companies that purchased Federal timber before January 1, 1982, to turn back contracts upon payment of a buy-out charge. The original contract period had to have been 10 years or less, and must still be in effect both on June 1, 1984, and on the date the company applies for buy-out. As the implementation date for buy-out of timber sale contracts became effective after October 1, 1985, the results will be reported in FY 1986. However, applications for timber to be bought out have been received and total 9.73 billion board feet. This buy-out will significantly reduce the volume of timber remaining under contract, to approximately 28.5 billion board feet.

#### **Timber Sale Cost and Value Comparisons**

In response to recent Congressional direction relating to the economics of the national timber sale program, the Forest Service has been studying improved methods to account for the costs, benefits, and revenues of the timber sale program. A task force has investigated, formulated alternatives, tested, and is now evaluating different techniques for timber sale program accounting. It is expected that the Forest Service

alternative will be presented to the Congress in March 1986.

The recent congressional and public interest in the Forest Service timber sales program has centered on concerns that the cost of selling some timber exceeds the monetary value of the timber. Table 25 compares the cost of the program to the value of (1) timber and miscellaneous products sold, and (2) some other outputs associated with this volume. These include recreation, wildlife and fish, range, and free-use fuelwood, and the estimated value of these outputs. In three Regions, the selling value of timber and miscellaneous products alone is above the estimated cost. When considered along with the value of selected outputs, all Regions yield positive returns. Nationally, this value exceeds the cost by 153 percent.

The table does not present a complete picture of the economics of the timber sale program. Instead, it is a snapshot in time of an ongoing and complex process. The Forest Service usually begins planning a timber sale 5 to 7 years before it is offered. Following the sale, harvesting will typically last 3 years and sometimes much longer. After harvest, reforestation and sale-area improvements may take another 5 years. In 1985, approximately 367,000 timber sales were purchased; there was a similar number in various stages of presale preparation, and similar number in various stages of postsale activities. The costs shown in table 25 reflect activities in 1985 in all of these sales at different stages of the sale cycle. The value, on the other hand, relates only to products sold and some associated outputs in 1985.

The table has no entries for the enduring asset values created by the timber sale program. The primary example is the road network created to provide access to harvest areas. This network will also provide easier and cheaper access to future harvest areas; facilitate fire, disease, and insect

## **HOW VALUES ARE CALCULATED**

### **Value of Timber Products Sold**

The value of timber products sold refers to the amount of money the Forest Service expects to receive from the timber sale. It is based on the bid rates for timber at the time the contract is signed. The timber value does not include purchaser credit—the value of permanent roads built by purchasers. Nationally, the total value sold and harvested is an aggregate of 370,000 sales, involving 18 types of forest products, and 70 tree species.

### **Value of Timber Products Harvested**

The value of timber products harvested is the adjusted amount paid for the timber at the time of harvest. This value is the basis of the Forest Service monthly billing to the purchaser. The value harvested also has the purchaser credit removed. The value of timber harvested from a sale may differ from the bid value because of price adjustment provisions in the contract and differences between estimated and actual volumes.

### **Money Received from Timber Products**

Money that the Forest Service receives from the sale of timber products varies from reported harvest value, mostly because the Forest Service does not actually receive this money until 45 days or more after the billing. Until then, the selling value of the timber is covered by performance payment guarantee, bonds, or advance cash deposits.

control efforts; and create additional opportunities for various types of dispersed recreation. The task force examining timber sale accounting will provide a process to evaluate appropriate asset values for roads.

Another example of a value not included in the table is the portion of sale proceeds used for reforestation, which creates a growing asset value for future generations.

Also not included in table 25 is a measure of the economic support that the timber program provides to dependent industries and communities throughout the country. The magnitude of this benefit varies considerably from one region to another and is most pronounced in the small communities in lightly populated areas of the West and in Alaska and the Lake States.

Recognizing the importance of timber sales to these communities, Congress has enacted legislation authorizing special funding in areas where the timber-producing land base has been reduced. The Boundary Waters Canoe Area Wilderness Act and the Alaska National Interest Lands Conservation Act are examples of such legislation.

Because of their magnitude, the road expenses are shown separately with no attempt to show proportions. All other expenses are simply included in timber costs.

Shown in table 25 are some of the measured multiple-use outputs that are enhanced or supported by the timber sale program. The outputs shown are wildlife and fish user-days, recreation visitor-days, range forage, and free-use fuelwood, all of which can be reasonably estimated. There are, however, multiple-use benefits supported by the timber sale program that cannot be easily quantified. For example, in harvests designed to regenerate aspen stands in the Rocky Mountains and the Lake States, the visual qualities and

wildlife values of these stands are difficult to quantify. Similarly, a sale may be conducted in a high-use recreation area to create a roadside vista or improve public safety, but it is difficult to quantify these values.

### Salvage Sale Program

Approximately 1.5 billion board feet of salvageable timber was sold in 1985. About 961.6 million board feet, or 65 percent, was sold under the salvage sale fund program. This program, authorized under the National Forest Management Act of 1976, allows the Forest Service to use money from salvage sales to cover the cost of preparing and administering the sale of insect-infested, dead, damaged, or down timber, including engineering work necessary for roads. Approximately 10 percent of the volume sold under the salvage sale fund program was bought by small timber operators with fewer than 25 employees. A major effort to salvage insect-infested timber is continuing in the National Forests in the South and the Rocky Mountains.

The salvage sale program has assisted in the timely preparation, sale, and removal of this damaged material. Major sale offerings have involved timber killed by the southern pine beetle epidemic in Texas and Louisiana during the last 2 to 3 years, by the mountain pine beetle throughout the central and northern Rocky Mountain area, by blowdown timber in Pennsylvania and the Lake States, and cleanup of hurricane-damaged timber in the Gulf States. This timber generally sells for a substantially lower price than green timber and provides a source of inexpensive timber for small size-class purchasers.

### Fuelwood and Other Miscellaneous Products

In 1985, firewood use from National Forest System lands continued a decline that began in 1982. The equivalent of 2.4 million cords of fuelwood were sold or given free in fiscal year 1985

compared to 5.1 million cords in 1982, 3.4 million cords in 1983, and 2.7 million cords in 1984.

The reported decline in firewood use reflects both decreasing demand due to lower prices for oil and gas and initiation of a charge firewood permit program in place of the free-use program.

The use of firewood as an alternate source of heating will continue; however, the recreational values associated with it may soon predominate. Fuelwood use should level out, possibly stabilizing at the 2.5 to 3.0 million-cord demand range. The fuelwood sold from National Forests has generated a significant increase in revenues to the Treasury, rising from \$85,000 in 1981 to \$5.7 million in 1985.

### Silvicultural Examinations

Data from silvicultural examinations are used to develop site-specific prescriptions to meet multiple-use objectives. Silvicultural examinations also provide essential basic timber data for the land management planning process. In 1985, the examination program was funded for 5.7 million acres, with 6.1 million acres actually examined.

### Reforestation

Almost 370,000 acres of National Forest land were reforested in 1985. Of this total, 175,000 acres were reforested using appropriated and Reforestation Trust Funds, while 195,000 acres were funded by money set aside from timber sales under the Knutson-Vandenberg Act (K-V) (tables 28 through 30).

The backlog reforestation program was completed in fiscal year 1985 as required by Congress. Of the original 3.1 million acres, about 1 million acres were actually treated, 0.7 million acres were examined and found to be satisfactorily stocked already, 1 million acres were removed due to changes in land classification (such as inclusion in wilderness areas), 0.2 million acres were removed for multiple-use reasons (such as

retention for wildlife forage areas), and 0.1 million acres were removed for other reasons (such as land exchanges or acreage adjustments). It was not feasible to treat about 47,000 acres by the end of fiscal year 1985 because of lack of proper seed, lack of access, lack of technology, or pending land-use decisions. These acres will be included in regular reforestation program plans and will be treated as the barriers are removed. Funding for treatments on 680,000 of the 1 million acres treated since fiscal year 1976 came from appropriations and the Reforestation Trust funds. The remainder of the reforestation was accomplished with K-V funds.

At the close of 1985, about 827,000 acres needed reforesting. This figure includes approximately 420,000 acres resulting from timber harvest, fires, insects, diseases, windstorms, and unsuccessful reforestation treatments during the past year. The southern pine beetle epidemic alone added nearly 33,000 acres to this past year's new reforestation needs. Deforestation due to insects and diseases occurred on more than five times as many acres in 1985 as in normal years.

An average of 87 percent of all reforestation treatments have successfully met stocking objectives over the last 5 years. In 1984 (the latest data available), success was 90 percent.

The average cost of all reforestation in 1985 was about \$347 per acre (appropriated \$328 and K-V \$364). This year's cost was about 15 percent more than 1984 due to the completion of the more difficult backlog reforestation acres which remained to be treated in this program and low costs in fiscal year 1984 on areas which had advance site preparation work done with Jobs Bill funding in fiscal year 1983. (Table 28)

### Timber Stand Improvement

Timber Stand Improvement (TSI) refers to several types of

noncommercial stand treatments designed to improve stand growth or quality. The future usable yield of timber stands can be increased anywhere from 15 to 25 percent with treatments such as thinning overly dense stands, eliminating competing shrubs or weed trees, or applying fertilizer to stimulate tree growth. As of October 1, 1985, TSI treatment was prescribed on about 1.5 million acres. This includes reforested stands that may need thinning or release to maintain a healthy, vigorous condition.

In 1985, a total of about 421,000 acres received TSI treatment. Various appropriated funds were used to treat 300,000 acres; K-V funds were used on an additional 121,000 acres (tables 31 through 33).

The average cost of all TSI in 1985 was about \$125 per acre, a decrease of 6 percent from 1984. Costs were lower because of competition for TSI contracts and because of modifications in fuel hazard reduction requirements.

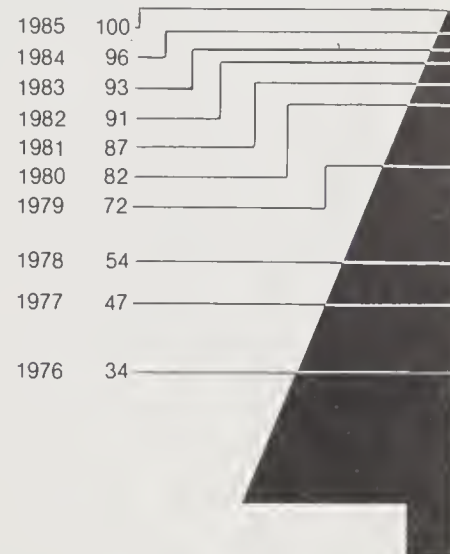
Tables 29 through 35 provide detailed information on needs, accomplishments, and the certification of reforestation and TSI.

### Forest Tree Improvement

The tree improvement program is designed to select trees with superior growth or disease resistance characteristics as breeding stock to produce seed for improved seedlings for the Forest Service planting program. Yields should be at least 10 percent greater on lands reforested with this genetically improved planting stock. Major gains were made in the tree improvement program during 1985. More than 5,200 superior trees were selected, 1,008 acres of seedling tests were planted to evaluate the genetic worth of the selections, and 104 seed orchards were established to produce improved tree seed. Over 18,000 pounds of seed were harvested in seed orchards this year, accounting for 38 percent of the total amount of seed collected.

### Reforestation<sup>1</sup>—Elimination of Backlog

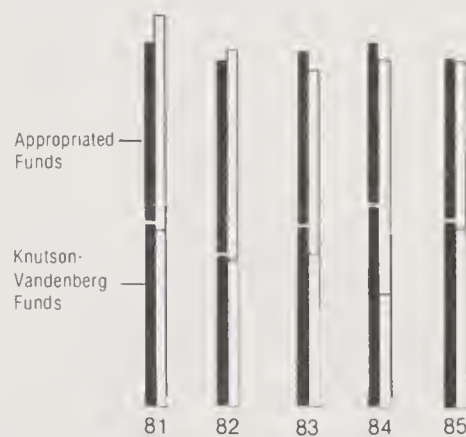
(Percent Reforested)



<sup>1</sup>Includes acres actually treated, acres re-examined and found stocked, and acres classified to other non-timber uses, such as wilderness.

### Reforestation

Total					
Funded	395 0	373 0	384 3	339 0	373 6
Accomplished	422 7	382 8	361 7	376 0	369 8



	(Thousand Acres)				
Funded	195 1	206 0	191 0	124 0	172 3
Appropriated	199 9	167 0	193 3	215 0	203 1
K-V					
Accomplished	217 9	221 6	193 2	180 7	175 2
Appropriated	204 8	161 2	168 5	195 3	194 6
K-V					

**Timber Stand Improvement**

Total					
Funded	369.6	317.0	374.7	323.7	346.4
Accomplished	396.4	361.0	397.6 <sup>1</sup>	361.6	421.4

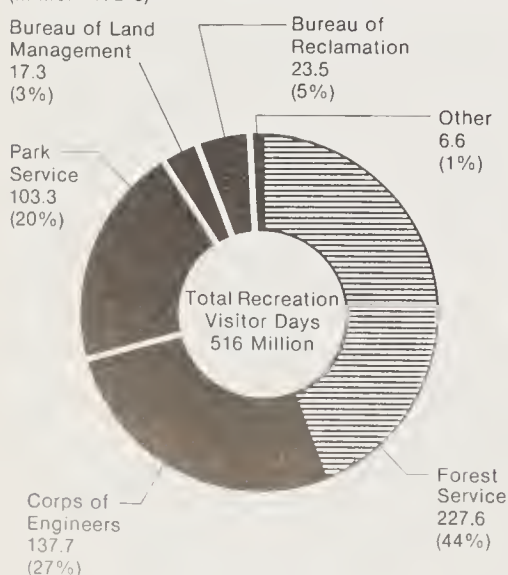


■ Funded					
Appropriated	234.2	180.0	235.0	181.7	287.2
K-V	135.4	137.0	139.7	142.0	122.6
□ Accomplished					
Appropriated	257.0	240.2	270.6 <sup>1</sup>	250.1	300.5
K-V	139.4	120.8	127.0	111.5	120.9

<sup>1</sup> Does not include 158,000 acres accomplished with Federal Emergency Jobs Bill funds.

**1984 Recreational Visitor Days by Federal Agency**

(Million RVD's)

**Inventory and Planning**

Inventories refer to the collection of basic resource information for the development of the timber portion of the forest plans now being prepared under the National Forest Management Act planning process and for the RPA assessment. The Forest Service annually inventories approximately 10 percent of its land base for timber information.

New allowable sale quantities (volume of timber available for harvest each year) and supporting timber management activities for the next 10 to 15 years are being established for each of 156 National Forests. The allowable sale quantities in the 23 final and 67 draft Forest plans issued to date indicate a slight increase over the volume of timber sold in recent years for these Forests. However, a final and total comparison cannot be made until all Forest plans are complete, sometime in 1986.

**RECREATION**

The Forest Service's goal in managing outdoor recreation on NFS lands is to provide for a variety of recreation experiences in a natural setting.

**Recreation Use**

More outdoor recreation occurs on NFS lands than on any other single landholding. According to the most recent data available, the National Forests and National Grasslands receive 44 percent of the total visitor-days of use that take place on Federal lands.

National Forest recreation includes a wide spectrum of activities ranging from camping at constructed facilities to backpacking in primitive settings (tables 36 and 37).

In 1985, 225.4 million recreation visitor-days (RVD's) occurred on NFS lands, less than a 1 percent decline from the prior year. The 1985 use was 88 percent of the RPA goal (table 13). Of the total

use, 12.7 million RVD's occurred in wilderness and primitive areas. Since 1981, recreation use on NFS lands has declined 4.3 percent—3.5 percent at facilities and 4.9 percent in undeveloped areas.

Reasons for decline have not been fully determined; however, many feel that site deterioration and closures are a factor, as they affect the quality of the outdoor experience. Refinements in our counting of RVD's may have also adjusted the numbers to reflect a decline.

Use at Forest Service-operated facilities such as campgrounds, picnic areas, and swimming and boating sites was 49.0 million RVD's. This amounted to about one-fifth of total recreation use. Facilities operated by other public agencies or the private sector on NFS lands, such as ski areas, accommodated an additional 15 percent of total visitation.

Recreation use away from facilities in undeveloped forest areas accounted for 143.5 million RVD's or about two-thirds of total use, demonstrating the continued popularity of the more unconfined, unregulated recreation opportunities. To bring attention to the many outdoor recreation opportunities available, the Forest Service in conjunction with the Travel of Tomorrow Council initiated a new media campaign, "Room to Roam." The focus of this campaign is to show visitors to the Forests the many recreational opportunities available to them while using the private-sector facilities for overnight accommodations and services.

## Receipts

The Forest Service is continuing with plans to increase fee receipts throughout the 1980's. In 1984, the median fee for a NFS campsite was \$4.07. In 1985, the median fee increased to \$4.11 with 1,950 campgrounds on the fee system. This compares to 1981, when the median fee was \$2.34 and there were 1,648 campgrounds on the fee system. All Forest Service facilities that meet the criteria in the Land and Water Conservation Fund Act of 1965 are now on the fee system.

Fees for use of Forest Service facilities generated \$12.1 million in 1985 compared to \$11.9 million in 1984. Fees for recreation special uses, derived primarily from ski areas and recreation residences, generated \$18.7 million, an increase from \$15.6 million in 1984. User fees for recreation residences were again lowered this year as directed by Congress in the 1985 Appropriations Bill.

Total recreation receipts in 1985 were \$30.8 million. Expenditures for operation and management of recreation facilities and use were \$102.1 million. Fees, therefore, recovered 30 percent of costs.

In 1985, interpretive associations contributed \$70,000 to the National Forests from gross sales of \$460,000, primarily from books and maps. (An interpretive association is a nonprofit, public service organization established to further the interpretation and understanding of resource management on the National Forests.)

## Trails

The trail system, used for resource management activities as well as for recreation, provides access to vast areas of NFS lands (Table 38). The 1985 RPA goal for trail construction and reconstruction was 2,127 miles. The target actually funded in 1985 was 514 miles. Work was accomplished on 721 miles, 40 percent above the

funded level (66 percent below the RPA goal). In addition, employees in human resource programs constructed or reconstructed 298 miles; 135 of these miles were done by volunteers. Currently there is a backlog of \$100 million in needed trail reconstruction.

## Recreation Facility Management

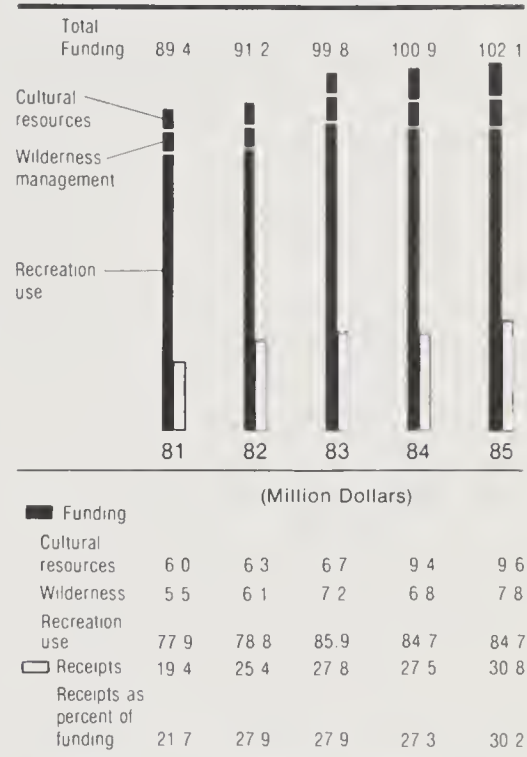
Historically, as National Forests have become more heavily used, recreation facilities have been built to protect the environment as well as to provide for visitors. These facilities include campgrounds, trailheads, boat ramps, picnic areas, and visitor information centers.

When a facility is operated and maintained at the standard service level, it is expected to last its designed project life. When operated at a less-than-standard level, facilities usually depreciate faster and must be totally replaced sooner. In 1978, 74 percent of the opened facilities were managed at the standard level. Since then, it has been necessary to defer or reduce the standard of maintenance and cleanup and shorten the length of time some facilities are open for public use. In 1985, 29 percent of the facilities opened for public use were operated at standard service level.

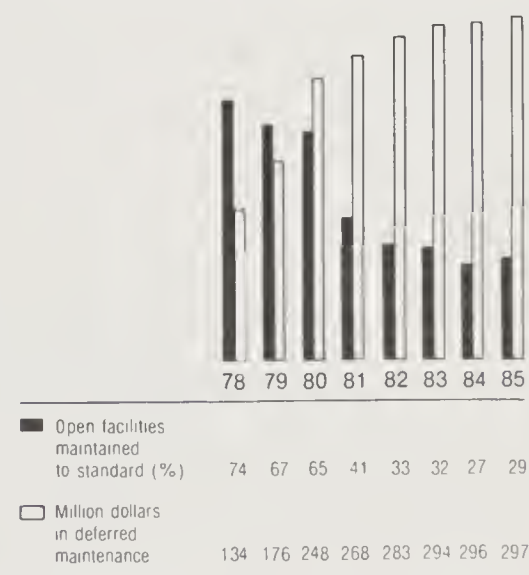
For several years, part of the scheduled maintenance of Forest Service recreation facilities has been postponed. This deferred maintenance now totals \$297 million.



## Recreation—Funding and Receipts



## Recreation Facilities Operated at Standard Level of Maintenance Compared to Accumulating Deferred Maintenance



Winter recreation use on the National Forests increased almost 17 percent in 1985.

### Recreation Site Construction

In 1985, Congress appropriated \$11.8 million for recreation construction. Included in this amount was \$5 million for Mt. St. Helens facilities (see Mt. St. Helens section); \$300,000 for Sunny Dene Resort, and \$600,000 for recreation facilities on the Bankhead National Forest in Alabama. The balance provided for high-priority needs, primarily rehabilitation and reconstruction of existing facilities.

### Cultural Resource Management

The Historic Preservation Act of 1966 directs the Forest Service to protect significant properties during activities that disturb the surface of the land, e.g., roadbuilding and campground construction. Archeological surveys must be done before project proposals can be approved. In 1985, survey sampling was done on 2.4 million acres. These surveys identify properties that have cultural or historical significance. Of those properties evaluated, 255 are now on the National Register of Historic Places, and an additional 8,500 are deemed eligible for listing.

### Mount St. Helens National Volcanic Monument

In fiscal year 1985, visitation to the Mount St. Helens National Volcanic Monument increased by 10 percent to 500,000 people. In addition, 325,000 people visited the temporary Visitor Center.

Although the majority of use at the National Volcanic Monument occurred between June and

October, a considerable increase in winter recreation activities, particularly cross-country skiing, was observed.

During fiscal year 1985, significant progress was made in the capital investment program associated with the National Volcanic Monument. Twelve miles of trail were opened for public use and 42 more miles are in the preconstruction and construction stages. Wells were drilled at two trailheads to provide potable water to visitors. Survey and design work began for reconstruction of Road 99, the major public access road in the Monument. Contracts were awarded for the rehabilitation of a campground and the construction of three viewpoint/interpretive sites. In addition, substantial work was done on the construction of the parking lot and relocation of the road for the new Visitor Center. A contract for construction of the Visitor Center building was awarded, and it is to be completed in the summer of 1986.

### **WILDERNESS**

The goal in managing wilderness is to provide for wilderness use, protect wilderness resources, and reduce conflicts between the uses and the values of wilderness.

These values include solitude and naturalness, as well as ecological and geological features of scientific, educational, or historical value.

The Forest Service provided leadership in the preparation of "Wilderness Management—A Five-Year Action Program." This multiagency program is a direct result of the National Wilderness Management Workshop held at the University of Idaho in 1983. It is a guide to improving wilderness management practices in cooperation with citizen organizations, research and educational institutions, State agencies, commercial recreation interests, and all others interested in preserving an enduring resource of wilderness.



*The Mount Saint Helens  
Visitor Center, Washington.*

Recreational use of wilderness and primitive areas totaled 12.7 million RVD's, up from 1984, when use was 10.2 million RVD's. The amount of land in the Wilderness System has also increased. The 98th Congress added 163 wildernesses to the System, bringing the total number to 327. In addition, 49 existing wildernesses were enlarged. In all, there are approximately 32.1 million acres of wilderness on NFS lands.

## WILDLIFE AND FISH

The Forest Service is responsible for managing wildlife and fish habitat on NFS lands, while the States are responsible for managing the animal populations on these lands. Wildlife and fish program plans developed with 42 States under the Sikes Act are part of the Forest planning process. Wildlife and fish planning goals are based on public demand, costs, and net economic benefits.

The wildlife and fish resource provided nearly 32 million user-days for hunters, fishermen, birdwatchers, and others. (These are included as RVD's in the recreation use figures in tables 36 and 37.) These activities represent about 14 percent of all recreation on National Forests. Using RPA planning information, the value of hunting provided, which is about half of the total wildlife and fish user days, is estimated at \$366 million; the value of fishing provided is estimated at \$206 million. A total of \$36.7 million was appropriated, which is 72 percent of the 1985 RPA goal (\$50.8 million).

### Wildlife and Fish Habitat Improvement

Habitats were improved in 1985 to maintain current levels of wildlife and fish production in concert with other resource programs.

The Forest Service used appropriated funds to improve 157,800 acres of habitat, which was 100 percent of the funded target and 24 percent of the 1985

RPA goal. Most of this effort was for offsite mitigation of impacts from other resource activities. Prescribed burning, which is one of the least costly habitat improvement practices, accounted for most of the habitat improved, particularly in the Southern Region.

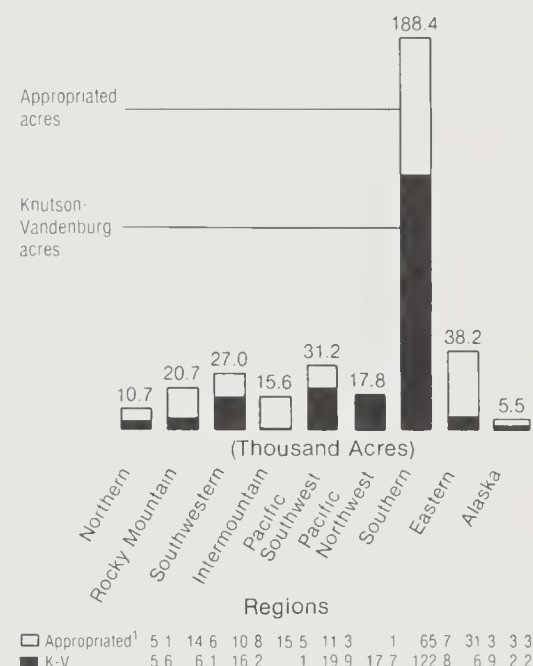
Knutson-Vandenberg (K-V) funding from timber harvest receipts is a very important component of the wildlife habitat management program to maintain wildlife habitat quality in areas affected by timber harvest and other resource development. Approximately 197,400 acres of wildlife habitat were treated with funds from timber sale receipts. K-V funding was increased to \$5.9 million in 1985 from \$5.1 million in 1984 because of increased timber harvest levels in 1985 and an increase of wildlife and fisheries habitat mitigation that can be accomplished through the use of K-V funds (Table 42).

Additional acres of habitat were benefited because of wildlife and fisheries technical assistance to other resource activities, such as timber harvesting, stand improvement, and rangeland improvement, which contributes to the maintenance or enhancement of habitat quality.



## Habitat Improvement

Total acres-355.2 thousand



<sup>1</sup>Includes wildlife, fish, and threatened and endangered species habitat improvement (See table 42)

*Habitat improvement is important to maintain fish populations on the National Forests, where over 15.8 million fish/user days were provided in 1985.*

Habitats were improved to maintain populations of wildlife and fish species in public demand such as deer, elk, grouse, wild turkey, waterfowl, trout, and bass. Results include the following:

- Salmon and steelhead habitats were improved in California, Idaho, Oregon, Washington, and Alaska. Approximately \$3.8 million was spent in these States on stream habitat development, fish passage, and lake fertilization. In the Columbia River basin, these activities were supplemented by Bonneville Power Administration funds provided under the authority of the Northwest Power Planning Council.
- In 1984, Ducks Unlimited, Inc. (DU) expanded its waterfowl habitat protection and improvement activities to public lands. A memorandum of understanding between DU and USDA authorized cooperative projects with DU funds on National Forest lands. In 1985, the first three wetland habitat improvement projects funded by DU under this agreement were completed on the Chippewa National Forest in Minnesota. Also, this year the Forest Service entered into a cooperative agreement with DU to install 200 artificial nest islands in ponds on the Copper River Delta in Alaska to provide nesting habitat for dusky Canada geese.

Forests and Regions continued development of wildlife and fish habitat capability models this year. The Eastern Region developed a procedure for evaluating muskellunge habitat using existing data. The Northern Region developed a model to determine the cumulative effects of sediment on fish populations, which will be used to develop alternatives and to assess economic impacts to the fishery on the Flathead National Forest and other Forests in Montana and Idaho. The Alaska Region (Tongass National Forest) developed two types of models to improve habitat planning and management for the Sitka black-tailed deer. The first model is used to calculate a habitat suitability index to evaluate the potential of habitat to support deer. The second deer model estimates amounts of winter habitat required to sustain deer populations at levels that meet public demand.

These and other models were added to the Forest Service's Wildlife and Fish Habitat Relationship (WFHR) system in 1985.

The WFHR system has aided in integration of wildlife and fisheries in Forest plans, improved our ability to quantify wildlife and fisheries resources, and provided better methods for addressing diversity, viable populations, and featured species production.

*Management of peregrine falcon habitat and reintroductions of this endangered species on National Forest System lands are important to their recovery.*



Considerable effort was devoted to the development of a Public Involvement Action Plan for the grizzly bear. An integral step in the recovery of the grizzly bear is to reduce conflicts between grizzlies and humans.

Significant progress has been made in recovery efforts for the Puerto Rican parrot and the red-cockaded woodpecker. Management emphasis continued on the peregrine falcon, bald eagle, and spotted owl (a sensitive species), mountain caribou, California condor, Kirtland's warbler, and Lahontan cutthroat trout.

Habitat improvement funding for threatened and endangered species was maintained at the same level (\$2.5 million) as in 1984.

#### Resource Coordination

Wildlife and fish habitat needs are considered in planning for resources development programs such as timber and minerals. Timber management programs are important to help meet habitat improvement objectives for species such as deer, elk, and turkey. For example, timber sales are planned to improve elk habitat by harvesting in locations that will provide forage close to areas of cover. Funding of resource coordination was maintained in 1985 at about the same level (\$12.6 million) as in 1984.

#### Threatened, Endangered, and Sensitive Species Management

There are 108 threatened and endangered and/or proposed species on NFS lands. Forest Service management programs are designed to prevent jeopardy to listed species or their habitat. Currently, 64 listed species on NFS lands have recovery plans approved by the U.S. Fish and Wildlife Service. Management emphasis in 1985 was concentrated on 10 priority species.

The Forest Service continued to emphasize grizzly bear recovery efforts, both through the National Interagency Grizzly Bear

Committee and on individual National Forests. The mapping of potential grizzly bear habitat was doubled to 2 million acres in 1985. Cumulative-effects models were developed to assess the impacts of multiple-resource management activities on grizzly habitat.

#### **RANGE**

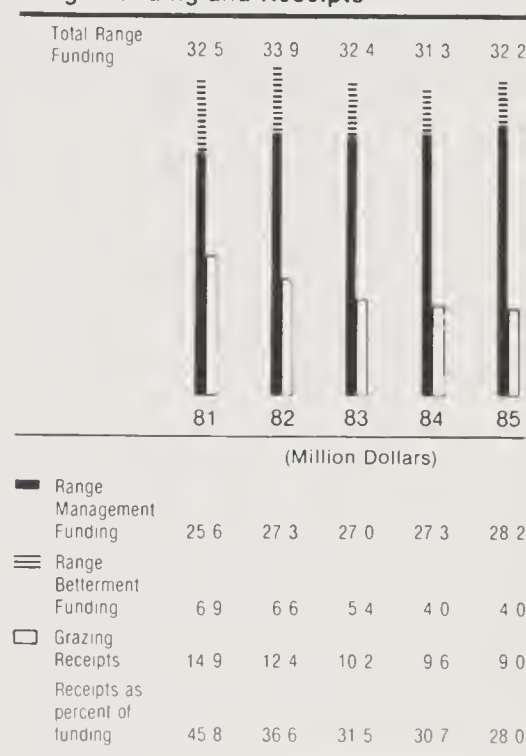
Range in the National Forest System is managed to maintain or improve land productivity for grazing and other uses. The manner and degree to which vegetation is used affect water quantity and quality, soil productivity and stability, wildlife habitat, visual resources, and forage for livestock and wild, free-roaming horses and burros.

The range program was funded at \$32.1 million in 1985, returning \$9.0 million from grazing fees. Such receipts were 57 percent lower than the peak in 1980. The decrease results from the lower fees charged per animal month and not from reduced grazing use.

Grazing fees are determined through a formula prescribed by the Public Rangeland Improvement Act of 1978. The formula considers the rates for leasing private grazing lands, the difference between costs of grazing on public and private lands, beef cattle prices, and the costs of livestock production. Since a modest increase in beef cattle prices was more than offset by increases in livestock production costs--in grazing year 1984--, grazing fees were lowered 2 cents from 1984 levels, to \$1.35 per animal month in 1985.

In 1985, we accomplished 10.1 million animal unit months (AUM's) of permitted grazing use. This exceeds the funded target of 9.8 million AUM's and meets the RPA goal of 10.1 million AUM's. (An animal unit month is the amount of forage needed to support a 1,000 pound animal for 1 month.)

#### **Range Funding and Receipts**



Over 14,000 ranchers graze livestock on National Forest System land and National Grasslands.



Participative management by range users, wildlife interests, and Agency representatives is used to develop and implement range management programs. Through this approach cooperation is significantly improved among various interests, which encourages and expedites actions that can lead to improved range conditions.

The Forest Service administered 14,550 permits during the year for grazing cattle, horses, sheep and goats. Grazing permittees depend on this forage to complement livestock operations on their lands.

Efforts continued to improve range and watershed conditions and produce more forage and browse on NFS grazing allotments. Treatments prescribed in allotment management plans were started on 351 allotments during 1985, and improved management continued on 7,237 allotments, or 71 percent of all allotments. Benefits from these activities are realized anywhere from 3 to 30 years after they are started.

Structural improvements such as fences, water developments, and pipelines were constructed on 1.5 million acres, 136 percent of the funded target. Nonstructural

work, such as seeding, burning and mechanical treatment of vegetation was completed on over 80,000 acres, 108 percent of the funded target.

The Forest Service captured 264 excess wild, free-roaming horses and burros and offered them for adoption.

Noxious weeds of various species occur on 1.6 million acres of NFS lands in the Western States. These weeds create a management problem adversely affecting a wide variety of land values, including wilderness, wildlife and livestock forage, soil and esthetics. A viable program for controlling noxious weeds depends on a coordinated effort by all landowners. In cooperation with local weed-control districts, the Agency treated 20,441 acres of NFS lands.

Through its ecology program the Agency is developing classification criteria for forest and rangelands that serve to guide the inventory and management of range allotments. These classifications will help managers predict the response to various vegetation treatments and grazing systems, thus increasing the efficiency of the range improvement program.

## SOIL, WATER, AND AIR

The objectives of the soil, water, and air program are to (1) provide an adequate supply of quality water to meet public needs, (2) protect and improve soil productivity, and (3) maintain or enhance air quality.

### Resource Coordination

Many soil, water, and air objectives are accomplished jointly with the implementation of other management programs. This is done by designing conservation practices that avoid resource damage, control nonpoint sources of pollution, and maintain riparian values and air quality.

Approximately 40 percent of the appropriated funds were spent on resource coordination.

## Air Resource Management

This is the first Report to include accomplishments in air resource management. Forty-seven preconstruction permit applications were reviewed for pollution emissions from private-sector developments. Major work was done on applications from oil, gas, and minerals industries. Approximately \$2.5 million was spent for the air resource management program in 1985. Roughly 80 percent of these funds were contributed from other programs and agencies.

The joint EPA/Forest Service Western Lakes Survey sampled 388 acid-sensitive lakes through the mountainous West. Preliminary testing demonstrated that data collected by ground and helicopter access in wilderness are comparable. Complete results should be available next summer. EPA contributed funds for this air-resource-related activity.



## Monitoring

Monitoring of soil, water, and air resources determines the effectiveness of management practices. Examples of 1985 accomplishments follow.

- Monitoring determined that site preparation burning on NFS in Mississippi during hot summer months was causing erosion exceeding tolerable levels. Burning dates have been changed and other standards developed.
- Papermill sludge is being used to stabilize loose sand road surfaces on the Chequamegon NF in Wisconsin. Monitoring

results from shallow collection wells indicate no subsurface contamination by phenols. State concerns have been satisfied.

- Monitoring on the Nezperce NF has determined the effectiveness of slash filter windrows in reducing erosion from fill slopes of road prisms and verified estimates made by Forest Service research. Slash filter windrows reduced fill slope erosion by 80 to 90 percent. This soil and water conservation practice is very cost effective if done concurrently with road construction.
- Treating South Carolina Piedmont land (Sumter NF) in an unsatisfactory condition with 400 lb/acre of 35-17-0 fertilizer has increased ground vegetation from 50 percent to 100 percent and increased the diameter growth of 10-year-old loblolly pine by about 50 percent over a 5-year period.
- The effectiveness of management practices in conserving soil and water was surveyed on the Shasta-Trinity NF. Results indicate the need to refine practices for slash disposal methods near streams and road construction on highly erodible soils. Corrective actions were programmed.

## Emergency Rehabilitation

Emergency rehabilitation plans were made for 24,285 acres of flood-damaged lands under the Agriculture Credit Act of 1978. These NFS lands were primarily in Utah. Burned-area rehabilitation plans were made for grass seeding and other erosion control measures on 125,675 acres. This year saw the largest acreage under rehabilitation since 1981.

## Inventories

In 1985, the Forest Service completed soil inventories on 6.6 million acres as compared to an average of 7.1 million acres during past 3 years. These inventories provide information about soil

*Water samples being collected with a Van Dorn sampler as part of the Western Lakes Survey.*

productivity, erosion, and stability problems. Most Forest Service soil surveys are conducted as part of the National Cooperative Soil Survey.

Inventories were also completed on an additional 3.1 million acres for water resource data. They provided information needed to improve water yields, quantify water rights, and determine conditions in riparian areas.

Water resource inventory targets were exceeded in Alaska, where there is a joint effort by Forest Service Watershed and Fisheries staffs and the State to describe stream channel condition and capability for fishery and other uses. Soil resource inventory targets were exceeded in Colorado, where less intensive surveys were done in wilderness areas.

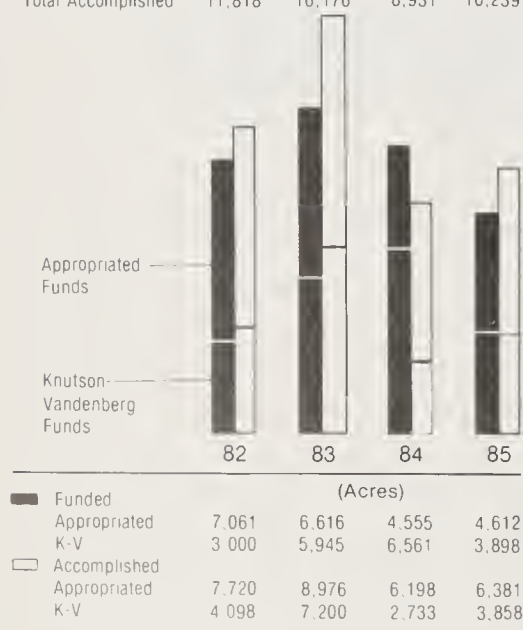
Progress was made toward achieving RPA improvement goals through several other programs:

Knutson-Vandenberg (K-V) Act funding from timber harvest receipts is an important component of improving soil and water productivity. Many cost-efficient improvements such as restoring the productivity of abandoned roads or gravel pits can be done on sale areas. K-V funded improvements on 3,858 acres in 1985.

Approximately 90 acres of abandoned mined lands were treated with funds from the Surface Mining Control and Reclamation Act and other State sources. Human resource programs and volunteers improved watershed condition on another 1,806 acres.

#### Soil and Water Resource Improvement

Total Funded	10,061	12,561	11,116	8,510
Total Accomplished	11,818	16,176	8,931	10,239



#### Soil and Water Resource Improvement

Soil and water improvement from all funding sources totaled 12,135 acres or 34 percent of the 36,000-acre RPA goal and 143 percent of the funded target of 8,510 acres.

Appropriated funds were used to improve watershed condition on 6,381 acres. Included in this total are 225 acres treated with funds authorized by the Lake Tahoe Basin Act.

Targets were exceeded in Montana because of contributed work by FS fire crews, and in Utah, where low-cost aerial seeding was done.

#### FACILITIES

Due to the large staff and equipment required to manage the extensive National Forest resources, many building facilities are needed. More than 21 million square feet of owned and leased facilities support programs in the National Forest System, Research, and State and Private Forestry.

Most of these facilities (78 percent) are owned rather than leased by the Forest Service. Owned facilities include such things as crew quarters, equipment storehouses, aircraft hangars, garages, and administrative offices. Most Forest Service facilities were constructed with a

A watershed project at the Lake Tahoe Basin Management Unit, California.



life expectancy of 30 to 35 years, and at this point more than half are structurally and/or functionally obsolete. As these buildings age, they need more expensive maintenance. Historically, funding for facility maintenance has been less than 1 percent of replacement value. This has resulted in a rising backlog of postponed maintenance tasks.

The Forest Service is implementing improvements in facility planning processes and maintenance management. Based on the results of the initial evaluations, more cost-effective maintenance is being provided. Additional opportunities have been identified related to the long-term goal of cost-effective management, replacement and maintenance of Forest Service buildings. Energy conservation improvements alone have saved an estimated \$1.75 million per year since 1984.

## ROADS

### Construction

In 1985, most Forest Service road construction projects were for initial timber management access, and most reconstruction projects were to improve existing access to timber sale areas. Funding for these roads came from three sources: (1) Purchaser Credit Program (PCP), which provides for building roads in exchange for timber; (2) Purchaser Election Program (PEP), which allows small purchasers to elect to have the Forest Service build roads funded from timber payments; and (3) Forest Road Program (FRP), which provides for building roads with appropriated funds. Thirty-three percent of the FRP funds were used to build roads and bridges. The balance of FRP funds (67 percent) also provide engineering support (road location, survey, design, construction inspection, and program management) for all roads, including those built by the purchaser. Fewer than 100 miles of roads were built to provide initial access for managing resources other than timber in 1985.

A total of 8,042 miles of road were constructed or reconstructed through PCP, PEP, and FRP at a total cost of \$345.9 million, including engineering and program support. This compares to the RPA projection of 13,601 miles constructed or reconstructed for all roads. The PCP/PEP constructed 2,566 miles and reconstructed 3,618 miles. The FRP constructed 757 miles and reconstructed 1,101 miles.

The average gross unit cost per mile decreased from \$46,604 in 1984 to \$43,005, in 1985 due to continuing efforts to lower unit costs. In 1985, 6.5 percent more miles were constructed/reconstructed than in 1984. Of the total miles, 6,184 were funded through PCP and PEP, and 1,858 were funded through FRP.

One road construction issue in 1985 was the charge that the Forest Service was accelerating road construction in presently unroaded areas to preclude these areas from consideration for wilderness. The issue was investigated by the House Appropriations Committee and was completed in April 1985.

The findings were:

- Miles of road construction over the past 5 years has been relatively constant.
- New roads to be constructed over the next decade are less than current levels.
- Of roads to be constructed in the next decade, 20 percent will be in roadless areas.
- Roads constructed in roadless areas will be limited to those areas released or recommended for development.

Based on these findings, the Surveys and Investigations Staff concluded:

- The Forest Service is not on a roadbuilding "binge."
- The Forest Service does not have a secret plan to increase road construction into roadless areas.

These findings do not support the media articles published on these issues.

The following table compares accomplishments and unit costs for

Road Construction/Reconstruction  
(Actual dollars in thousands)

FY 1983			
	<u>Cost</u>	<u>Miles</u>	<u>Cost/Mile</u>
FRP	76,116	1,953	39.0
PCP	131,812	5,733	23.0
PEP	15,833	662	23.9
FY 1984			
FRP	62,760	1,567	40.1
PCP	111,057	5,507	20.2
PEP	10,673	475	22.5
FY 1985			
FRP	67,057	1,858	36.1
PCP	107,887	5,712	18.89
PEP	9,103	472	19.3

road construction/reconstruction for fiscal years 1983-1985. The costs shown are for the actual construction work and exclude program support and engineering support for the FRP, PCP, and PEP construction programs.

In 1985, average overall cost per mile for road construction in the PCP and PEP was \$18,915 - seven percent less than in 1984. PCP and PEP costs were lower because of continuing efforts to reduce road design standards, build the minimum number of roads necessary to harvest timber, and limit reconstruction to a minimum level suitable for timber hauling. Bids and construction costs were also lower because decreased demand for timber roads has heightened competition among contractors.

Of the 6,184 miles of road built via PEP and PCP, 473 miles were turned back to the Forest Service for construction under the PEP (table 48). Many small purchasers elect to have the Forest Service build these roads in lieu of purchaser credit. This purchaser-elected option is used by those who do not have the capital, equipment, and/or personnel to build roads.

Some of the newly constructed/reconstructed roads will not be fully open for public use because of the safety hazard of mixing public traffic with timber-hauling traffic on reduced-standard roads. Also, approximately 75 percent of roads constructed in 1985 will be closed to all traffic during wet weather, when roads and other resources are more susceptible to erosion.

#### Maintenance

The 343,293-mile Forest Development Road System provides the principal access to National Forest System lands and thereby either directly or indirectly supports all National Forest resource program outputs.

Maintenance of this system is financed primarily by Federal appropriations and by requirements on commercial users (including timber purchasers). The type and frequency of maintenance is determined on a case-by-case basis. Although exact figures are not available, specific accomplishment for fiscal year 1985 will not vary significantly from that of fiscal year 1984. Fiscal year 1984 accomplishment, as determined in the Forest Service response to a specific congressional request, indicated that:

- Nineteen percent of the road system was closed to all vehicle traffic.
- Eighty-one percent of the system was open to public use.
- Fifty percent was usable with high-clearance vehicles. (High-clearance vehicles include pickup trucks, 4-wheel drive vehicles, logging equipment, or all vehicles other than normal highway passenger cars.)
- Thirty-one percent was usable with modern low-clearance passenger cars.

#### **PROPOSED FS/BLM LAND INTERCHANGE**

The interchange is a legislative proposal by the Forest Service and the Bureau of Land Management (BLM) that would transfer responsibility for land and minerals management between the two Agencies for the purpose of improving public service, increasing management efficiency, and saving Federal dollars.

On several occasions, the BLM and the Forest Service have worked out arrangements, through Memoranda of Understanding, for managing interspersed parcels of Federal land under each other's jurisdiction. The interchange, therefore, is not a new idea. But it is on a much larger scale effort to increase efficiency and reduce federal spending than previous efforts to streamline the management of lands administered by the two Agencies.

In January 1985, the Forest Service and BLM announced a proposal to interchange land management responsibility on approximately 35 million acres and transfer minerals management responsibility from BLM to the Forest Service on 200 million acres. During the period from January to May, several hundred meetings were held, and contacts were made with various segments of the public. A revised proposal was made to the public in early June.

After its release, the two agencies conducted 30 formal public hearings, and a public comment period, which ended on July 8. The agencies found good support for the objectives of the proposal but considerable opposition to some of the specifics. Since July both agencies have worked to further modify the proposal to respond to public concerns. The agencies expect the revised proposal to be smaller but still significant in terms of acres involved and dollars saved.

The FS and BLM are currently consulting with key Congressional representatives and Governors whose States would be impacted by the proposal. An impact statement and the legislative proposal are expected to be ready for consideration by Congress in 1986.

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# STATE AND PRIVATE FORESTRY

## INTRODUCTION

State and Private Forestry provides technical and financial assistance to States to help maintain and increase the productivity of non-Federal forests and other lands. Principal goals include fire protection and improved management on private non-Federal lands and protection from insects and diseases on all lands. These programs are authorized by the Cooperative Forestry Assistance Act of 1978.

States are responsible for managing and planning public programs aimed at improving the productivity of non-Federal forests and forest operations. The Forest Service assists States in those activities that provide national benefits.

The State and Private Forestry cooperative programs are presented in four categories:

- Cooperative Land and Resource Protection
- Forest Management and Utilization
- Special Projects
- Other Programs

Congress appropriates funds to the Forest Service for programs in the first three categories. Funds for "other programs" are transferred to the Forest Service by the Soil Conservation Service and other Federal agencies. Targets, listed in tables 52 and 53, are accomplished with a combination of State and Federal funds.

## COOPERATIVE LAND AND RESOURCE PROTECTION

### Forest Pest Management

The Forest Pest Management (FPM) program assists forest managers in protecting forest resources from insects and diseases on lands of all ownerships. FPM specialists work directly with

National Forest managers and forest managers in other Federal agencies, such as the U.S. Department of the Interior and Department of Defense, to provide an integrated forest pest management program on all Federal lands. The program also provides for technical and financial cooperation with State and private forest managers to see that effective pest management is practiced on these lands. The program was funded at \$28.8 million in 1985; non-Federal sources contributed an additional \$11.9 million.

### Surveys and Technical Assistance

Detecting and evaluating pest problems in their early stages provides information that is used to keep the loss of trees and tree growth at a minimum. The costs of suppressing insects and diseases are also maintained at the lowest possible levels within available resources.

Detection and evaluation surveys were made on 556 million acres of forested lands of all ownerships in 1985; Federal lands accounted for 19 percent. This is 36 million acres more than the funded target for 1985, but 79 million acres less than the 1985 RPA goal. Of the 92 million acres evaluated, 1.2 percent received treatment.

Surveys were in response to the gypsy moth outbreak in the Northeast and Oregon, the western spruce budworm and mountain pine

*Sticky traps baited with a sex attractant such as this one are used to monitor certain insect populations.*



beetle outbreaks in the West, the southern pine beetle outbreak in the South, and the spruce decline along the Appalachian Mountains.

### Suppression

State and Private Forestry encourages forest managers and private landowners to practice integrated pest management (IPM) so that timber, watersheds, recreation, wildlife, and visual resources are protected. IPM is a decisionmaking and action process incorporating biological, economic, and environmental evaluation of pest-host systems to manage pest populations. IPM depends on thorough evaluation and uses the best combination of available pest prevention and suppression tactics, including silvicultural, biological, chemical, mechanical, and manual means. The effects of IPM prevention tactics are usually expressed years after implementation.

Forest Pest Management funded or cost-shared the IPM treatment of insects and diseases on about 1.11 million acres of forested lands in all ownerships in 1985; 22 percent of this amount was on Federal lands. Approximately 784,280 acres, or 71 percent, were treated with insecticides. Of these acres, 63 percent were treated with *Bacillus thuringiensis* (B.t.), a bacterial insecticide; 37 percent with dimilin, an insect growth regulator; and less than one percent with conventional insecticides.

Major pest suppression projects were conducted against the gypsy moth in the East, southern pine beetle in the South (see below), and dwarf mistletoe, mountain pine beetle, and spruce budworm in the West. These suppression projects protected an estimated 3,133 million cubic feet of merchantable timber and salvaged an estimated 152 million cubic feet of infested merchantable timber, resulting in approximately \$ 277 million in direct benefits. Recreation, wildlife habitat, watershed, and visual resources were also protected.

The timber killed by the southern pine beetle outbreak on State and private lands increased from 10.5 million cubic feet on 13,134 acres in 1984 to 71.6 million cubic feet on 110,230 acres in 1985. Timber killed on Federal lands during the same period increased from 11.8 million cubic feet on 10,757 acres in 1984 to 53.3 million cubic feet on 54,770 acres in 1985.

The Forest Service assisted the Animal and Plant Health Inspection Service (APHIS) technically in grasshopper suppression activities in several Western States and technically and financially (\$700,000) in the Oregon gypsy moth eradication project.

### Special Projects

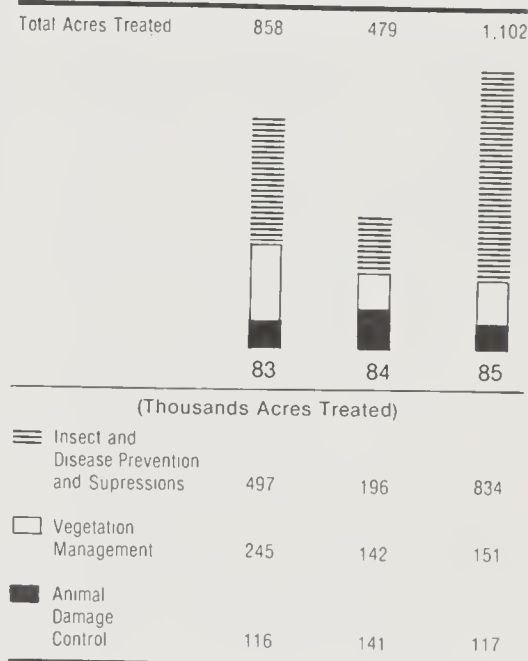
Special projects were conducted to acquire pest-impact information, improve existing technology, and transfer new technology.

Projects include production of a virus to treat the Douglas-fir tussock moth on 50,000 acres, continuing participation in the Cooperative Maryland Gypsy Moth IPM Project to evaluate treatment strategies on 1.8 million acres, and participation in an interagency program to provide pesticide benefit and risk information to the U.S. Environmental Protection Agency (EPA). This effort included 20 projects covering 22 pesticides and 2 general studies. In addition, 306 Federal employees were trained in the proper application of pesticides in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act of 1978.

### Pesticide Use

Pesticides are a component of IPM. They are used to prevent and suppress insect and disease outbreaks, reduce unwanted vegetation, and control animals that cause damage. Pesticides are prescribed only after thorough

### Pesticide Use on National Forest System Lands



environmental analyses determine that their use is appropriate. Only chemicals registered by the EPA are used.

Use of pesticides on NFS lands increased in 1985 due to the gypsy moth eradication project in Oregon and the grasshopper control program in Idaho. In 1985 about 1,102,020 acres of NFS lands were treated with pesticides, including 151,225 acres for vegetation management, 833,503 acres for insect and disease prevention and suppression, and 117,292 acres for animal control. These figures represent pesticide applications on less than 1 percent of the total acreage of National Forests and Grasslands.

Table 54 is a summary of all pesticide use on National Forests and Grasslands in 1985.

#### Fire Protection

The Rural Fire Prevention and Control Program provides technical and financial assistance to support national interest in protecting non-Federal wildlands from fire. A major priority this year was to help States develop an efficient fire program that would serve the national interests through the use of the National Fire Management Analysis System.

The fire analysis system is an economic based analysis process

that is being used by State and Federal fire managers to help improve the efficiency of fire protection programs. Forty-seven States are currently conducting Statewide fire analysis. Five States have completed the analysis. Approximately 12 States will complete it in fiscal year 1986, and the remainder will finish in fiscal year 1987. Where analysis has been completed, State fire program budgets appear to be slightly below the most economically efficient level. This analysis project appears to have created some level of program stability within many State fire programs. States have also been able to identify improvements in program efficiency and effectiveness without budget increases.

For years, State and Private Forestry's efforts have been aimed at improving States' firefighting capability. This task has largely been accomplished. Current efforts are aimed at improving management of programs. A key part of this is the introduction of modern fire-management concepts. Many States are still operating with an objective of minimizing numbers of fires and acres burned. A number of States are debating the need for a new policy. The analysis is expected to provide many opportunities for establishing economic decisionmaking criteria.

*Interagency fire dispatch center at the Northern California Service Center at Redding, California.*



California is one of the many States using the analysis process as a major analytical tool to examine their policies and roles in providing fire protection. Michigan has used the analysis to examine protection needs resulting from the rapid development of recreation and permanent homes in forested areas. North Carolina has used the analysis to discuss funding priorities with State legislators.

The fire analysis process has provided fire managers with an opportunity to examine past fire-protection concepts in light of today's protection challenges and to look at future options for more efficient fire protection. This is one of the most significant benefits of the analysis process.

### Fire Prevention

A cooperative effort is underway in the Southeastern States to revitalize fire-prevention programs aimed at reducing the number of arson fires through increased use of fire investigation and law enforcement activities. During the near-record 1985 fire season, the major causes of disastrous fires were debris burning and arson. Cooperative Fire Protection orchestrated the development of a training program to help State employees learn to investigate the cause of specific fires. The first major training effort will take place in North Carolina in March 1986.

Fire prevention programs in 1985 explored the use of analytical processes to select specific prevention activities for combating fire losses. California, Arkansas and Pennsylvania began pilot programs to use analysis information to examine the efficiency of antiarson and debris-burning control programs. Development work is also underway to find solutions to the growing problem of protecting structures and people from fire in fire-prone wildlands. Forest Service Fire Research is assisting with these efforts.

Through our cooperative efforts, locally developed and managed fire-prevention cooperatives continue to grow in the Pacific Northwest, California, and the Lake States. Since 1977, 14 cooperatives have been developed. The cooperatives involve members from Federal, State, and local fire agencies as well as community and business leaders. The cooperatives are credited with effectively reducing fire losses in the Pacific Northwest during the 1985 fire season, one of the driest in the past 20 years.

### 1985 Fire Season

This year the Nation endured one of the most severe wildland fire seasons in recent history, with major fire activity in the Southeast, parts of New England, and the West. Cooperation between Federal and State fire organizations was outstanding, largely as a result of the cooperative agreements that were developed through the assistance of the Cooperative Fire Protection program.

In the Spring of 1985, the Southeast was besieged by wildfires to the point where local fire forces were completely committed. Through the National Interagency Fire Center in Boise, ID, reinforcements from Federal and State fire agencies in the West and Northeast were sent to assist Southern forces. Cooperative Fire Protection personnel assured the appropriate integration of State fire-fighting resources.

During July of 1985, major wildfires hit Federal- and State-protected lands in most of the Western States. A national mobilization of State and Federal fire-fighting resources was made to combat the western blazes. At the peak of fire activity, over 20,000 people were involved in fire-fighting efforts. State crews from Northeastern and Southern States were sent to help control western wildfires. The Forest Service provided information and guidance to both sending and

receiving units about where resources could be quickly located and transported.

### National Interagency Incident Management System

The National Interagency Incident Management System (NIIMS) coordinates predisaster planning by setting up a uniform fire-suppression organization, establishing common terminology, and improving communication networks among Federal, State, and local agencies.

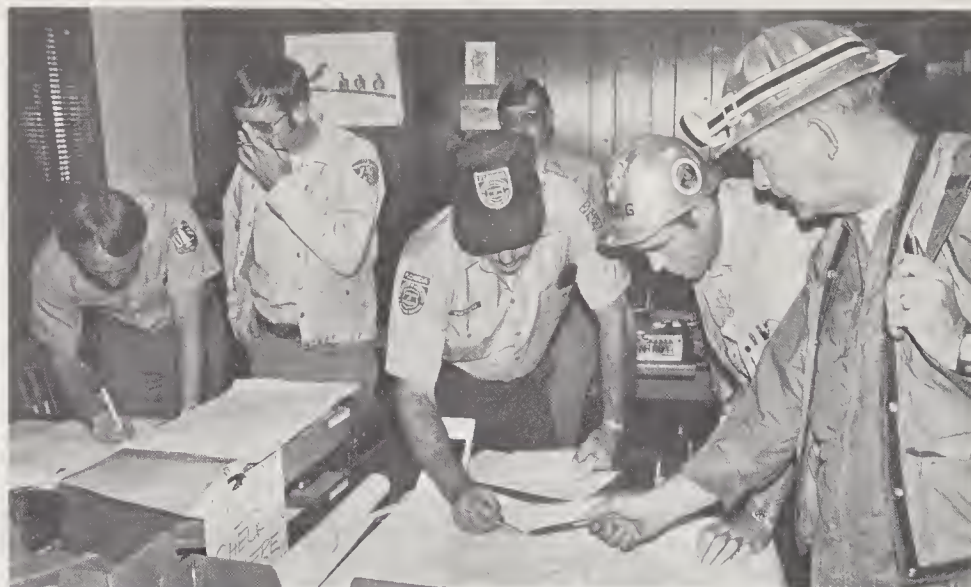
The Forest Service continued to provide national leadership by training and guiding agencies in their implementation of NIIMS. All of the Federal wildland fire-protection agencies are now operational in the system, as are the western State Forestry agencies and an increasing number of eastern States.

NIIMS was put to the test this year when all the fires in a record-setting year in the West were managed successfully under this system. Federal, State, and local fire managers reported increased mutual support, as well as efficiency in the fire-suppression organization. Minnesota also reported that the system was cost effective and that agency people there worked together better as a result of NIIMS training. The fires in drought-stricken Florida were also managed under NIIMS with reports of increased cooperation, effectiveness, and interagency support in suppression. The Forest Service has facilitated the transfer of this technology to other agencies and organizations for use in search and rescue, hurricanes, law enforcement, and planning for potential volcanic and earthquake disasters.

### Emergency Preparedness

Emergency preparedness in the Forest Service covers numerous activities dealing with multifunctional planning and response to emergency situations.

*The sharing of forces between State and Federal agencies is one proven way to improve efficiency in fire protection. An Interagency Command Team plots strategy for controlling a fire in Florida.*



This year, the Forest Service participated in a FEMA-sponsored earthquake response exercise called RESPONSE 85. The exercise was conducted in California and Washington, DC.

RESPONSE 85 was the first big step taken in the overall process for improving national, regional, State, and local participation in a simulated earthquake-response exercise. It brought out issues confronting Federal, State, and local governments and clarified the response actions required during such a crisis. The exercise led to a clearer picture of the effects of a catastrophic earthquake and gave the Forest Service the opportunity to examine and exercise internal response procedures concerning emergency fire suppression to State agencies, and emergency communication and preparedness training.

The experience gained from the exercise will be used to revise national and regional earthquake response plans, and to conduct future training in other areas of the United States in response to a catastrophic earthquake.

The Forest Service provided assistance to the Mexican Government during the earthquake disaster in Mexico City. The Agency sent 27 people with helicopters and support vehicles, along with other supplies, to support the operation.

## **FOREST MANAGEMENT AND UTILIZATION**

### **Forest Management**

The Forest Service provides technical and financial assistance to landowners, through State forestry organizations, to improve

productivity of nonindustrial private forest lands. Assistance is also provided to wood-using industries to encourage efficiency in harvesting and processing.

State service foresters developed forest management plans covering 3.6 million acres of nonindustrial private forest land. Reforestation was accomplished on 620,800 acres, timber stand improvement on 293,900 acres, and 134,300 landowners received technical assistance.

### **Wood Utilization**

The Forest Products Utilization (FPU) program has changed in the past year to reflect changing needs for technical assistance of State forestry organizations and other constituencies, and changing technologies. Consequently the utilization portion of the accomplishment tables has been eliminated because States no longer report accomplishments in this program.

The Forest Service continues its efforts to increase logging and sawmill production efficiency and reduce wood waste through traditional Falling and Bucking (FAB) studies, of which 169 were processed in 1985, as well as 254 Sawmill Improvement Program (SIP) studies. This compares with 199 FAB and 231 SIP evaluations during 1984. Since these programs are now available for anyone with a microcomputer, it is impossible to track accomplishments derived from their use by industry or State specialists.

The Forest Service processed 21 Veneer Improvement Program evaluations using a new program that became available this year to

help improve the efficiency of veneer mills and plywood plants. Initial results indicate a potential for improving the efficiency of veneer mills by an average of 9 percent if the results of the evaluations are implemented.

A computer program was developed this year to assist Administrators of National Forest timber sales to improve productivity and income for both the Forest Service and logging contractors. Until now, it has been difficult for sales administrators and timber purchasers to quantify the performance of contract loggers on the National Forests. This program ties in with Forest Service efforts to utilize the forest resource better and reduce the cost of removing logging residue prior to replanting or seeding cutover land. The program is being tested in the Pacific Northwest and will be made available to other regions as soon as it is perfected. It will not be possible to report accomplishments resulting from implementation of this technology.

The Forest Service is working closely with State Foresters and other agencies on increasing the export of forest products and the economic development of depressed areas with good potential for greater forest-products-related industry employment. This is being done through the introduction of new technologies which make better use of underutilized species or small and poor-quality logs of high-value species. This activity not only creates jobs in the local community but improves the residual forest for future generations and makes intensive management of the forest resource more attractive. Many areas of the country are benefiting from this program, but accomplishments are very difficult to measure.

#### Seedlings, Nursery, and Tree Improvement

The nursery and tree improvement program provides technical and financial assistance to States for



*Michigan landowners checking 20-year-old pine plantation. Kellogg Forest; Augusta, Michigan.*

upgrading the quality of seedlings in their nurseries. This assistance is aimed at those long-term investments and activities that lead to more productive reforestation of non-Federal lands at a reasonable cost.

The Federal-State goal in tree improvement is for all seedlings produced by 2000 to be genetically improved. A recent Forest Service study shows that only 27 percent, or 200 million, of the seedlings produced in State nurseries each year are genetically improved stock. Tree planting continues at a record setting pace. This gives urgency to the need to increase the percentage of genetically improved seedlings. A new approach is being used for nursery technical assistance in the Southeast, where 77 percent of tree planting is accomplished. It involves the use of interagency teams of specialists to evaluate and recommend improvements to nursery operations from seed collection through seedling distribution. This assistance is provided on request and has been very well received.

#### Urban Forestry Assistance

The urban forestry program focuses on providing a better quality of life through the management of trees, forests, and associated resources in and near urban areas.

During 1985, the Forest Service provided technical assistance to State forestry organizations. Federal funding to States was

about \$1.2 million for national urban forestry activities. These funds provided technical assistance to 5,149 communities (a 30 percent increase from 1984) and helped them in the development of their urban forestry programs. These efforts helped improve the urban and rural environment by:

- reducing the loss of forest and farm lands to urban sprawl,
- controlling soil erosion,
- protecting trees during development,
- increasing the use of urban wood waste for energy,
- planting trees for shade and protection.

Throughout the year, the Forest Service provided leadership and worked with 20 associations, representing approximately 260,000 members, to promote the concept of urban forestry. Examples of the most successful partnerships are those with the American Forestry Association (AFA), the National Urban Forestry Council, and the National Association of State Foresters.

In 1985 the Forest Service and AFA sponsored several regional urban forestry conferences that attracted over 1,200 participants. A special meeting in Baltimore on the Chesapeake Bay initiative was one example. In addition, the AFA printed a monthly series of "How To" articles in the "American Forests" magazine, and a quarterly newsletter called "The Forum,"

which included technical information pertaining to urban forestry, contributed by several Forest Service Regions and the Northeastern Area. Approximately 550 communities throughout the country received technical advice from state foresters to help them qualify for Tree City, USA status.

## MANAGEMENT IMPROVEMENT

### Statewide Forest Resources Planning

The Forest Service assisted States in a systematic process of forest resources planning, providing funding and technical assistance for specific projects. In 1985, Federal technical assistance to States concentrated on identifying ways of using State forest resources for economic and social development. Forest Service assistance entailed defining State program priorities and alternatives for implementation, and linking State forestry planning and programs to the State's budgeting process. The objective is to lead the States to assuming financial responsibility for areas previously supported through Federal funding.

Forty-eight States are in the process of developing or implementing long range forest resource plans designed to enhance the multiple values of forests in accord with State economic and social needs. California, Maryland, Minnesota and New Hampshire

*State foresters discuss forest management plans with landowner in Georgia.*



have legislated the planning process to a formalized, State-wide strategy. This legislation provides the long-range commitment and outlook necessary for the balanced development of forest resources.

The planning program was instrumental in achieving Governor's Conferences on forestry in Indiana, Minnesota, Oklahoma, Maine, Vermont and Arkansas. The conferees addressed problems and opportunities in areas such as employment, industrial development, emerging technologies, land-use shifts and environmental degradation. For States, the goal is to improve forestry programs, develop public/private sector partnerships and develop a desirable forestry future. Statewide plans are charting the direction and providing for State legislature support and funding to implement programs and actions identified through the planning process. This is particularly important as Federal financial assistance to States declines.

In 1985, Arizona and New Mexico completed draft plans; Iowa, Massachusetts, Pennsylvania, Vermont and Virginia completed final plans; Maine, North Carolina, Mississippi, Oklahoma, and Arkansas updated and improved existing plans. These plans cover a total of 126 million acres. The following pilot State examples have encouraged other States to intensify their planning processes:

- Michigan is taking a bold and innovative approach to strengthen and diversify its economy through the development of its forest resources. It has made a long range commitment to economic development with a goal of creating 50,000 jobs in the forest products sector over the next 10 to 15 years. Through goal definition, resource allocation, and integration with the State's targeted economic development plan, State and private sector leaders have devised a comprehensive marketing and

investment strategy designed to encourage economic growth.

- The Mississippi Forestry Commission's Five-Year Operation Plan provides program direction by identifying actions that will best correspond to anticipated State needs. The major thrust of the Commission is to protect and improve the forest resources in the broad context of four fundamental State goals:

- Increasing tax revenues
- Providing affordable housing
- Providing employment
- Diversifying the economic base

#### Technology Transfer

The technology transfer program provides direction and guidance to all units of the Forest Service on how to transfer new technology and information to potential users. The program facilitates the application of forestry information to optimize the use, management, and protection of the Nation's forest resources. Examples of technology transfer projects in 1985 include:

- Kudzu prescriptions, developed by Forest Service Research to assist landowners combat this imported tree-killing vine, are being transferred through the State and private organization to the 13 Southeastern States where kudzu is prevalent (covering 2 to 4 million acres). At least six vendors offer the treatment, and scores of private forest landowners are using it. One State forestry agency has a pilot program providing treatment, using a herbicide spray attached to fireplow tractors.
- Quick-Silver, an analytical model which provides a rapid method to assess the profitability of forestry investments on MS-DOS microcomputers, has been distributed by Forest Resource Systems Institute (FORS) a non-profit corporation providing

support to computer applications in forestry to over 350 users in both the public sector and in private industry. This new model, an enhanced version of the Forestry Investment Analysis Program for Apple<sup>TM</sup> Computers, enables forest managers quickly and accurately to assess potential profits from forest management options including income tax effects.

- Information required for the engineering design of a factory to manufacture composite lumber from southern hardwoods was transferred to factory owners, two engineering design companies, six major machinery manufacturers, two major adhesive manufacturers, and into two international building codes. Information to these users was provided by Forest Service personnel and cooperators in meetings, by direction consultation, in written reports and correspondence. As a result, construction of a \$30 million factory, a state-of-the-art facility for total tree conversion into lumber and use of hardwood species for construction lumber, was started in July 1985, in Roxboro, NC. The new technology, part of a technology transfer plan, will create 250 jobs.
- A new process developed by Forest Service researchers uses saturated steam to speed the press time for producing flakeboard, particle board, and medium density fiberboard. This process was transferred to members of the plywood and particleboard industry, associations and professional societies through technical papers, video tapes, exhibits and correspondence of Forest Service personnel. The National Forest Products Association has formed a steam-injection process task group, which has been involved in partial funding of large-scale panel manufacture trials in Krefeld, West Germany.

## SPECIAL PROJECTS

### Pinchot Institute for Conservation Studies

In 1985, the "Center of Excellence" concept for the Institute, housed in the former Gifford Pinchot home, was launched. Numerous conferences were hosted in the quiet and reflective atmosphere that characterizes the Grey Towers estate. The first of a series of Forest Service "Heritage Awareness" programs was presented to attendees of an annual management policy seminar. Conservation leaders from all parts of the Nation convened for a symposium on the impact of population shifts on renewable natural resources. The Grey Towers Center was particularly honored to host natural resource leaders from 28 nations for the introductory program to a 30-day A.I.D. tour of forest management and administration in the United States. Many of those forestry professionals are in new-ground-breaking roles similar to Gifford Pinchot's in this country at the turn of the century.

Four separate exhibits were held in the James Pinchot Art Gallery, on Victorian furnishings and lace, the Pinchot family, the works of three Forest Service artists, and the many moods of the Hudson River valley. The gallery was created last year to honor Rudy Wendelin, retired Smokey Bear artist.

A landscape restoration plan was prepared to bring the formal gardens back to their original splendor, which peaked about 50 years ago. A special project

reconstructed the wooden arches that form the canopy over the Pinchot's unique outdoor dining area.

During 1985, the staff gave 904 interpretive tours of the mansion and grounds to a total of almost 10,000 visitors. Other visitors came on foot, or by bus to concerts, lectures, conferences, exhibits or seminars. Total visitation was 18,500.

### Boundary Waters Canoe Area

The Boundary Waters Canoe Area (BWCA) Wilderness Act of 1981 authorized cooperation with the State of Minnesota in a forest management intensification program to be applied on State, county, and privately owned forest lands. The purpose is to mitigate the loss of timber production caused by incorporating forest lands into the BWCA. Federal funding is authorized for this program through 1990.

Accomplishments in 1985 with \$2.94 million of Federal funds and \$750,000 of State matching funds include 22,400 acres of reforestation, 11,800 acres of timber stand improvement, production of 21.5 million tree seedlings, marketing and utilization assistance for 2.9 million cubic feet of timber products, 386 miles of road reconstruction and maintenance, 20,000 acres of general forest management assistance, and forest inventory work on 760,000 acres. A pilot forest-resource plan of part of the BWCA area was completed, and two additional plans are being developed.

### Burton-Santini Act

The Burton-Santini Act (P.L. 96-586) authorized the Secretary of Agriculture to make financial assistance grants within the Lake Tahoe Basin for the purpose of reducing soil erosion and water pollution. The area includes acreage in Placer and El Dorado Counties, and the city of South Lake Tahoe, California as well as Douglas and Washoe Counties, Nevada.

*Pennsylvania Congressman McDade visits with Gifford Pinchot's grandson at Grey Towers.*



There are approximately 24 projects involved and one third of them have been completed. The remaining projects are in various stages of design and construction. Specific work completed in fiscal year 1985 was the installation of sediment traps, installation of drain pipes to improve drainage, rock lining of roadside ditchways, revegetation of eroding slopes and rerouting of traffic flow to paved areas.

A total of \$1,341,773 in financial assistance grants to local governments were awarded in fiscal year 1985.

## **OTHER PROGRAMS**

### **Forestry Incentives**

The Forestry Incentives Program (FIP) and the forestry practices of the Agricultural Conservation Program (ACP) provide financial incentives for owners of nonindustrial forest lands to increase timber production through reforestation and timber stand improvement.

In 1985, 180,000 acres were treated under FIP, and 68,000 acres were treated under ACP. Together, FIP and ACP account for nearly half of the total reforestation on nonindustrial private lands.

### **Tax Incentives**

Taxation was a major issue in 1985. On May 29, 1985, the "President's Tax Proposals to the Congress for Fairness, Growth, and Simplicity" were issued. The taxation task force of the Society of American Foresters (SAF) reviewed the proposals for their effects on forestry. The Forest Service participated in the task force's endeavors and made presentations at the SAF annual meeting and at meetings of the American Forestry Association and the National Council on Private Forests.

Congress is still acting on the President's proposals, and indications are that the process will continue well into 1986.

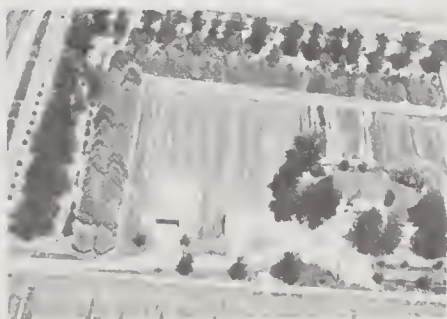
Analysis of their effects on forestry will also continue.

### **Rural Community Fire Protection**

The Rural Community Fire Protection Program provides technical and financial assistance to train, organize, and equip rural fire departments. In 1985, funds were available for 3,400 applications, selected from the more than 30,000 submitted by rural communities.

### **Resource Conservation and Development**

The Forest Service is responsible for the forestry aspects of the Resource Conservation and Development Program, under the administrative guidance of the Soil Conservation Service (SCS). In 1985, funds allocated to the Forest Service totaled \$802,000 for 50 of the authorized 194 project areas throughout the United States. In 1985, funds were used to train woodland owners, promote better utilization of forest products, develop biomass for energy, sponsor forestry field day demonstrations, market Christmas trees, develop wildlife habitats, present forestry educational programs, establish and maintain windbreaks, and stabilize eroding land by planting trees.



*Aerial view of a farmstead windbreak planting. Note rows of different tree species.*

### **Cooperative Watershed Activities**

The Forest Service provides technical leadership for the forestry aspects of the small watershed (PL 566), and flood prevention (PL 534) programs, emergency watershed protection, and river basin studies. These programs are administered by the SCS.

During 1985, a \$240,000 allocation assisted local sponsors in planning 65 small-watershed projects.

Seventy-nine small-watershed and flood-prevention projects were implemented throughout the Nation at a cost of \$3.6 million. This year, Forest Service personnel completed accelerated forestry activities such as landowner assistance in the Yazoo and Little Tallahatchie Flood Prevention Project.

River basin funds totaling \$1.117 million supported 45 studies to assess possible forest resource contributions to the economic and environmental health of river basins.

The SCS allocated \$1.8 million to the Forest Service in 1985 for emergency watershed protection projects in Utah, California, Nebraska, and Pennsylvania. These projects, located on both National Forests and private lands, lessened

hazards to life and property resulting from devastating floods, which occurred after heavy spring snowmelts and forest and range fires.

#### National Council on Private Forests

The National Council on Private Forests came into being on February 13, 1985, with Deputy Chief for State and Private Forestry John H. Ohman elected the first Chairman.

The Council was formed to help the major parties that affect nonindustrial private forest lands to improve communication and coordination, encourage consensus and landowner knowledge of consequences of alternative decisions, and provide information to decisionmakers.

The Council consists of representatives of the American Forestry Association, American Forest Institute, Association of

Consulting Foresters, USDA Extension Service, USDA Forest Service, National Association of Soil Conservation Districts, National Association of Professional Forestry Schools and Colleges, National Association of State Foresters, National Forest Products Association, National Woodland Owners Association, The Society of American Foresters, and USDA Soil Conservation Service.

The Council sponsored a seminar on forest taxation, and a series of four seminars in 1985/86 on the changing Federal role in nonindustrial private forestry. Council meetings are held approximately monthly, usually in Washington, DC, but meetings were also held in Fort Collins, CO; and Traverse City, MI, to help stimulate interest among observers and cooperators.

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# FOREST RESEARCH

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## INTRODUCTION

The Forest Service research program is responsible for developing scientific and technical knowledge to enhance the economic and environmental values of America's 1.6 billion acres of forest and associated rangelands.

Research is generally long range and high risk, covering a wide spectrum of biological, economic, engineering, and social disciplines. The program as a whole supports the mission and goals of the President, the Department of Agriculture, and the Forest Service.

Much of the research is national in scope, and some is international, extending to nearly every major terrestrial ecosystem. The geographic range of the program is from the tropics to the Arctic and from Hawaii and territories in the Pacific to Puerto Rico in the Atlantic.

Research is conducted through eight regional Forest and Range Experiment Stations and the Forest Products Laboratory at Madison, WI. More than 2,800 studies are in progress at any one time. Approximately 800 scientists are stationed at 75 locations throughout the States, Puerto Rico, and the Pacific Trust Islands.

The research program is planned and coordinated with related efforts at the 61 forestry schools and the agricultural experiment stations of Land Grant institutions throughout the United States. Forest Service scientists also work closely with researchers from other public agencies and the forest industry. Many of the scientific accomplishments described in this report will be used to help manage National Forests. New technology will be transferred to these land managers and to Federal, State, and local

policy makers through publications, symposia, workshops, and direct public contact (table 64).

The research program also supports international forestry through cooperation with other Federal agencies, the United Nations, and bilateral arrangements with a number of foreign countries.

The 1980 RPA research program emphasized development of new and better ways to increase the production of market resources and other forest-related values on forests and rangelands, and to develop new ways to protect and enhance the environment. Much of the research was directed toward solving problems relating to intensified, multiple-use management of the forest resource. A program of basic research was maintained to generate new knowledge in key problem areas in biology, engineering, and the social sciences.

In 1985 emphasis was placed on research that would (1) improve efficiency of natural-resource management and production systems, (2) strengthen and support Federal action programs and international initiatives, (3) protect the natural-resource base, and (4) serve critical consumer interests. Priority was given to maintaining research programs to increase forest productivity and timber utilization, reduce impacts of mineral extraction activities, enhance forest protection, and develop technology for multiple-resource management, basic biology, and atmospheric deposition.

In 1985 research appropriations totaled \$121.7 million, approximately 7 percent of which supported cooperative studies with colleges, universities, other research organizations, and industry (Tables 61 through 63). In addition, the Forest Service

received \$3,127,000 from outside sources for cooperative research (table 61).

## ATMOSPHERIC DEPOSITION RESEARCH

Forest Service research on atmospheric deposition expanded greatly during 1985. There is evidence that atmospheric deposition can cause acidification of watershed soils, streams, and lakes, resulting in adverse changes in aquatic ecosystems. Furthermore, it is possible that atmospheric deposition may be contributing to decreases in the health and growth of trees in several forest types in the United States. The Forest Service research program is designed to determine the effects of atmospheric deposition on forest resources and to determine how atmospheric deposition interacts with natural ecosystems to produce the effects. This information is essential for establishing appropriate policies concerning the regulation of emissions of air pollutants.

The Department of Agriculture is one of five departments or agencies in the National Acid Precipitation Assessment Program (NAPAP). The Forest Service represents USDA as leader of the NAPAP task group on terrestrial effects research. The Forest Service also conducts research as part of the NAPAP aquatic effects task group and operates acidic precipitation monitoring stations in support of the NAPAP deposition task group.

In 1985, the Forest Service atmospheric deposition research program was funded at \$7.4 million. These funds were supplemented by \$2.4 million "passed through" to the Forest Service from the Environmental Protection Agency (EPA) to support research on effects of

atmospheric deposition on several major forest types. Scientists conducted studies of the effects of atmospheric deposition on watersheds and forest vegetation throughout the Eastern United States, in the Rocky Mountains, and in the Sierra Nevada.

New Forest Service activity in 1985 focused on implementing the "Forest Response Research Program." This NAPAP research initiative is jointly managed by the Forest Service and EPA in cooperation with forest industries, through the National Council of the Paper Industry for Air and Stream Improvement.

The Forest Response Research Program includes a national vegetation survey and four research cooperatives, each focused on a different forest type (eastern spruce/fir, southern pines, eastern hardwoods, and western conifers). The goal of the vegetation survey is to determine the extent and location of forest conditions that may be related to atmospheric deposition. The goals of the cooperatives are to determine whether atmospheric deposition is affecting forests and to identify the specific components and mechanisms that lead to the effects. The cooperatives operate with participation of scientists from Federal and State agencies, universities, and private organizations. Much of the field research will actually begin during 1986. Some results of Forest Service research in 1985 include:

- A variety of natural and human-caused disturbances were found to affect the acidity of some New England ponds. These disturbances—such as beavers, fires, and dams—may have a more dramatic effect than atmospheric deposition. In some cases it may be impossible to isolate the effects of atmospheric deposition from other disturbances.
- In northern Minnesota, Wisconsin, and Michigan, several types of clearwater lakes have been identified that have

different risks of acidification from human-caused atmospheric deposition. Some of the lakes have become acidified.

Researchers developed a model that may make it possible to estimate the percentage of lakes that would become acidified (or de-acidified) under different deposition scenarios.

- A trend of increasing sulfate concentration was detected in stream water in the southern Appalachians. This may signal the beginning of a delayed response of the watershed to atmospheric deposition.
- In the mountains east of Los Angeles, nitrate deposition to chaparral ecosystems was recorded at record-high levels following smog episodes. This appears to be the result of dry deposits of atmospheric pollution. Nitrate contamination of ground water in the area may be linked to the high levels of nitrate in atmospheric deposition.
- Red spruce in the Northeast and several species of pine in the Southeast were found to be growing more slowly than expected. Atmospheric deposition is one of several factors that may be interacting to produce this result.

## FORESTRY COMPETITIVE RESEARCH GRANTS PROGRAM

In 1985, for the first time, \$7.8 million funding was provided for a Forestry Competitive Research Grants program. Congress stipulated that these funds were to be used to support fundamental research, equally divided between two areas: harvesting, processing, and utilization research with special emphasis on chemical, mechanical, and engineering properties of wood and wood materials; and basic research in forest biology, including biotechnology. This grants program was open to all segments of forestry, including Federal agencies, colleges and universities, State organizations, private industry, and private individuals. The program was administered by the USDA's Competitive Research Grants Office.

The scientific merit of proposals was judged by a peer panel review process. All scientists who submitted proposals were provided written summaries of review comments. A total of 476 proposals were submitted—many more than anticipated. Of these, only 54, or 11 percent, were awarded grants. The average grant was approximately \$135,000 and covered a 3-year period. The number of awards and the approximate funding given in each part of the program were as follows:

Program Area	Number of Grants	Amount (\$ million)
<b>HARVESTING, PROCESSING, AND UTILIZATION</b>		
Wood chemistry and biochemistry	12	1.75
Physical properties and processing technology	11	1.50
Structural wood engineering	5	.50
Subtotal	28	3.75
<b>FOREST BIOLOGY, INCLUDING BIOTECHNOLOGY</b>		
Genetic structure and function	11	1.50
Mechanisms for interactions in forest systems	15	2.25
Subtotal	26	3.75

## THREATENED, ENDANGERED AND SENSITIVE WILDLIFE AND FISH

Some 180 wildlife and fish species in the United States are on the Federal list as actually or potentially in danger of extinction. Of these, 47 occur, or potentially occur, on National Forests. As part of the effort to help these species recover, Forest Service research has studied habitat requirements of over 20 threatened and endangered species.

The Puerto Rican parrot, which ranks as one of the most critically endangered species, is the subject of cooperative Forest Service research efforts with the U.S. Fish and Wildlife Service and Commonwealth of Puerto Rico. From a low of about a dozen birds in 1971, the population has quadrupled. Current plans are to intensify work on this critically endangered species in an effort to identify nonnesting habitat requirements.

The red-cockaded woodpecker, a resident of southern old-growth pine forests, has also been the subject of intensive Forest Service investigations. Results of these studies form a critical foundation for planning and management of this species and will ultimately help to answer the question of how much habitat to manage for red-cockaded woodpeckers.

A limited investigation of grizzly bear habitat relationships in the northern Rocky Mountains was initiated in 1985. Planned research will focus on critically needed information to manage habitat for this threatened species.



*The Puerto Rican parrot, one of the most endangered species in the world, is the subject of intensive study. From a low of a dozen birds in 1971, the population has quadrupled.*

Other Forest Service scientists and cooperators are studying habitat requirements of species that, although not threatened or endangered, can be affected severely by intensive forest-management activities. One of these, the northern spotted owl of the Pacific Northwest, is closely associated with Douglas-fir forests that are over 250 years of age. The owl appears to be highly sensitive to reduction in age of forest stands. Current research has identified several other species resident in Douglas-fir old-growth forests. Planned investigations will better define the nature of their association with old-growth habitat.

Threatened, endangered, and sensitive species research completed in 1985 includes:

- Development of the "Red-Cockaded Woodpecker Recovery Plan," which gives the Federal strategy for management of this endangered species.
- Development of new information on factors limiting Kirtland's warbler populations on their breeding grounds.
- A major symposium on the northern spotted owl that brought together and synthesized all known information on this species.
- Identification of the characteristics of winter roost sites of bald eagles in northern New Mexico.

## PRODUCTS FROM WOOD FIBER

Research in papermaking technology has led to the invention of a new structural sandwich panel product which has been named Spaceboard. The new material is made up of pulp fiber sandwich panel components which are molded in a waffle-like configuration directly on the paper machine. Two such layers are bonded together to form a sandwich board that has exceptional and equal strength in both principal structural directions.



This technology is being combined with two other recent Forest Service research advances in paper technology—press-drying and cross-linking—which further increase product strength and water resistance. The name Spaceboard is derived from the light weight and great strength of the new material, which could have structural applications in space, or in closer-to-home uses such as temporary remote shelters or emergency housing for disaster or military use.

#### RESEARCH TO FOSTER INTERNATIONAL TRADE

International trade in forest products has increased substantially in the last 15 years. The United States is the world's largest importer of forest products, importing lumber, veneer, pulpwood, woodpulp, paper, and board products valued at \$12 billion in 1984, the most recent year for which data is available. The United States is also a major exporter of forest products. Total exports of forest products reached \$7 billion in 1984. Our vast forest resource base provides the United States with the potential to transform the Nation into a net exporter of forest products.

#### Trends in International Markets

Continuing research on methods to better understand the operation of international markets provides insights into the impacts of changes in the economic and policy dimensions of international trade in forest products. Results of a few Forest Service studies of international markets are as follows:

- The rapid increase in the European demand for high-grade oak lumber and veneer for the construction of furniture was analyzed by Forest Service scientists. They found that the export demand is affected by

currency exchange rates, the demand for furniture in European markets, and the price of competing European oak lumber. Activity in the international oak market also affects the prices in the domestic oak market.

- A study on the importation of softwood lumber from Canada projected that import quotas would shift a larger share of the domestic market to U.S. producers but would impact consumers of wood products with higher prices immediately. Similarly, a 15-percent tariff on imports from Canada would increase domestic prices for softwood lumber 6 percent by the year 2000 and 16 percent by the year 2030.
- The responsiveness of Japanese export demand for softwood logs and lumber to changes in price was studied. The Japanese demand was found to be less responsive to price changes than previously thought, partially because nontariff trade barriers, such as product grades and specifications, are thought to affect Japanese demand. Therefore, reductions in the manufacturing costs of forest products is only one way to increase the competitive advantage of American forest products.

#### International Trade and Product Sanitation

International movement of timber products, especially those with bark or those not kiln-dried, risks spreading potentially dangerous insects and pathogenic organisms. For example, one of the most damaging diseases of forest trees in the United States, the Dutch elm disease, was introduced on contaminated elm logs from Europe. Fear of similar occurrences has prompted many countries to enact stringent quarantine and phytosanitation regulations, restricting or prohibiting importation of certain types of timber products.

*A newly developed product called FPL Spaceboard can be made from low-quality wood pulp fiber and used to construct a large variety of high-performance structural products.*

A recent example is the restriction on movement of oak veneer logs with intact bark from the United States to Europe. Oaks, especially red oaks, in the United States are susceptible to the native oak wilt disease. This disease does not occur in Europe but is potentially damaging to native European oaks. Consequently, countries of the European Economic Community (EEC) require that oak veneer logs imported from the United States be fumigated with methyl bromide or be certified to have come from oak-wilt-free areas. Both are costly procedures. Recent research at the Forest Products Laboratory has resulted in a simple color reaction test to distinguish red oak logs from white oak logs. Since white oak logs pose no significant risk of spreading the disease, the EEC is willing to allow importation of white oak logs identified by this new method.

The pine wilt disease provides another example. The nematode causing pine wilt disease is native to the United States and does not cause significant damage. But it did become a serious problem on Japanese red and black pines in Japan when inadvertently introduced into that country. Scots pine, the most important European pine species, is known to be highly susceptible. Recently, living nematodes were found in pine chips exported to Finland, and that country promptly placed an embargo against conifer wood chips originating in North America. Other members of the EEC are expected to follow Finland's lead. Research is currently underway to find a practical solution to this problem.

#### International Trade in Forest Products

Forest products offer good opportunities for expanding U.S. exports. The high-quality, abundant, and low-cost wood supply and forest products manufacturing capabilities of the United States are being fashioned to fit foreign markets. Forest Service research is facilitating

exports by assisting in the development of uniform product standards, utilizing a greater variety of domestic species in the manufacturing of wood export products, and tailoring new products to specific export demands.

#### **COUNTERATTACK ON THE GYPSY MOTH**

Following its accidental introduction into the United States from Europe in 1869, the gypsy moth has spread over most of the Northeastern States as far south as Maryland, Virginia, and West Virginia, and as far west as eastern Ohio and Michigan. Isolated pockets of gypsy moth defoliation have also flared up in five other States, as far west as Oregon and as far south as South Carolina. Defoliation has declined through natural gypsy moth population reduction from a high of 12.8 million acres in 1981 to 1.0 million acres in 1984. Pest control specialists are projecting a possible return to epidemic populations in this decade.

Since 1982 the Forest Service has worked closely with university scientists and other cooperators to restructure the Forest Service gypsy moth research program. A series of workshops and meetings was convened to identify research priorities and shift needed in research direction, and to prepare a plan for expanded research that includes substantial support for extramural studies. The goal of this renewed gypsy moth program is to obtain the knowledge needed to manage gypsy moth populations, both where they are now established and where they might be in the future. Actions taken to achieve this goal include:

- A new 5-year program of gypsy moth research was developed.
- A new research unit was established in Morgantown, WV, to evaluate silvicultural options for gypsy moth control, develop ways to measure impacts, and model gypsy moth life systems.

- A technology transfer plan was prepared to assure early delivery of research findings to potential users.
- The gypsy moth now poses a threat to western forests as evidenced by a large infestation in Oregon. A research plan was prepared to provide information relating specifically to western forest conditions.

#### **LAND AND RESOURCE PROTECTION RESEARCH**

##### Fire and Atmospheric Sciences Research

The objectives of this activity are to (1) develop improved methods to prevent wildfires or control them once started, (2) reduce wind- and weather-related losses of forests, (3) use prescribed fire to achieve forest and range objectives at less cost, and (4) reduce loss of life, property, and forest resources from fire. Examples of 1985 accomplishments follow.

- Research has developed a way of determining the number and locations of fire weather stations needed for a given resource management prescription. The resource managers' need for weather information is translated into quantitative criteria that the computer uses to select optimum locations for weather stations
- A system for recording fire behavior has been assembled using video cassette recorders and computers that record and analyze fire behavior much more quickly than has previously been possible. The system was developed primarily for research purposes, but it holds much promise for use in fire management.
- Scientists have shown quantitatively, for the first time, that law enforcement reduces arson wildfires. This is particularly significant because arson is the leading cause of wildfires in the United States

today. Results of this research, when coupled with cost and value data, will allow managers to determine the most economically efficient level of arson law enforcement.

### **Forest Insect and Disease Research**

The objectives of this activity are to develop technology to prevent or reduce forest and rangeland damage by insect and disease pests and protect wood in use and storage from wood-destroying insects and decay. Results are used to develop environmentally safe and effective strategies for pest management, and to help integrate pest management with forest resource management. Examples of 1985 accomplishments follow.

- The Integrated Pest Management Research, Development, and Applications Program for Bark Beetles of Southern Pines has completed a series of publications that present comprehensive information on bark beetles and diseases affecting southern pines. The information is useful to researchers, pest management specialists, and forest managers.
- Experiments conducted in Idaho evaluated the effectiveness of applying two insecticides—permethrin and fenvalerate—for protection of cones of blister-rust-resistant western white pine trees from pine beetles, worms, and moths. With proper timing and rates of application, the two insecticides significantly reduced infestations of insects that attack cones. All insecticide treatment regimes tested had positive benefit/cost ratios.
- In a joint undertaking, Forest Service scientists cooperated with the Georgia Forestry Commission to develop fusiform rust-resistant loblolly and slash pine seedlings. Preliminary tests show that incidence of rust in treated seedlings is reduced by 40 percent in loblolly and 50



percent in slash pine over nonresistant seedlings.

### **Forest Inventory and Analysis**

This activity provides comprehensive, continuing information and analyses of the characteristics of forest land resources of the United States. Forest inventory data, monitoring surveys and results of analyses are used by forest industry, financial consultants, and State resource planners as a basis for industry expansion decisions, financial investment analysis, State forestry programs, and public and private forest policies. Survey activities in 1985 include:

- The average State forest inventory cycle has been sped up from 14 to 10 years, nationwide.



*A once productive southern pine stand in Georgia decimated by fusiform rust infections.*

*During the past 5 years, the average period between successive forest resource inventories has increased from 14 to 10 years nationwide.*

- During the fifth inventory of Georgia's forest resources, scientists gave special emphasis to the incidence and source of timber damage. Hardwoods were found to have more damage than softwoods, and more saplings were damaged than either pole timber or saw timber. By knowing the types of damage present, the relative incidence, and the damaging agents involved, forest managers can design more effective and efficient control programs.
- In a continuing effort to improve methods of projecting use patterns of forest acreages, scientists developed a land-area projection model based on proxy values that represent economic returns for different land uses. The model will allow both public and private planners and managers to evaluate alternative policies and forest land management practices based on various projections.

#### Renewable Resources Economics Research

The objectives of this activity are to develop and apply methods to analyze the responses of forest products market to economic and institutional forces and to structure economically efficient forest management activities. Research contributes directly to National Forest management decisions and the design of both public and private forest management programs. Research results are also used by individual landowners and forest products processing firms to manage their resources efficiently. Examples of 1985 accomplishments follow.

- In examining the problem of below-cost timber sales, investigators determined that the desirability of such sales cannot be evaluated apart from the managerial context within which the Forest Service operates. When considered within the managerial context, below-cost timber sales may be totally compatible with and even

essential to optimal management of a National Forest.

- Two methods of economic analysis were used to estimate values per trip, per calendar day, and per user-day for many fish and wildlife species sought by recreational hunters and anglers in Idaho. Resulting dollar value estimates measure hunters' and anglers' willingness to pay for outdoor experiences over and above their actual cash expenditures. Such measures are needed for making resources management decisions that meet societal needs most efficiently.

#### **RENEWABLE RESOURCE MANAGEMENT AND UTILIZATION**

##### Trees and Timber Management Research

The objectives of this activity are to (1) develop improved silvicultural alternatives and management guidelines needed to increase the productivity and multiple-use benefits of forest lands, (2) maximize the growth and quality of forest trees, and (3) maintain the productivity of the land. Timber management research ensures that the information and technology needed to achieve full productivity are developed and promptly made available. Examples of 1985 accomplishments follow.

- To manage plantations infected with fusiform rust, managers must be able to assess probable impacts of the disease on future forest yields. This has been difficult because of the complexity of factors that influence the impact of the disease. However, scientists are unraveling this complex problem. They have developed mathematical models that condense all factors affecting forest yields in infected plantations and provide realistic predictions of resulting yields.

- Biotechnology techniques applied to forest trees is rapidly coming closer to reality. Scientists have, for the first time, developed a method for gene transfer. They have successfully transferred genetic information from a common bacterium into loblolly pine. This result makes it possible to transfer genes derived from other plants or genes created in the laboratory into most commercial tree species.

- To help northern hardwood forests achieve their economic and ecologic potential, Forest Service silviculturists gathered together all of the past research on northern hardwoods and published the results in 48 Northern Hardwood Notes, which cover all aspects of management, from insect and disease control to regeneration methods and creating wildlife openings. These notes are available in loose-leaf form from the Superintendent of Documents.

- A major symposium was held to collect state-of-the-art information on management of the vast lodgepole pine forests of the West. The published proceedings contain current information on fire relationships, regeneration and stand culture practices, growth and yield, harvesting and utilization, and a look at the future of lodgepole pine forestry.

##### Watershed Management and Rehabilitation Research

The objectives of this activity are to develop and test new, cost-effective methods for rehabilitating lands disturbed by surface mining and for protecting, managing, and improving forest and rangeland watersheds. The research helps planners and managers meet long-term water quality and flow needs, rehabilitate surface-mined lands, and determine the relationships between land uses and water quality and flow. Examples of 1985 accomplishments include:

- Researchers have developed a technique that uses information from aerial photographs to determine the relationship between physical structure of stream channels and upstream logging activity in the Pacific Northwest. The technique gives forest managers a rapid and inexpensive way to compare watersheds that have different characteristics with alternative management treatments in order to evaluate resulting potential changes in watershed conditions.



*Disintegration of the high-sodium gully bank (above) was necessary before vegetation could stabilize the channel (below).*

- Forest Service scientists have developed a method applicable to North America for estimating how much sulfate and nitrate in the air is natural and how much is emission-related.



- Researchers found that emission-related sulfates and nitrates are linked to acidification of 5 to 10 percent of the clear-water lakes in northeast Wisconsin and Upper Michigan. Related research findings allow the prediction of lake acidification at various emission levels and prediction of the ability of various kinds of lakes to neutralize acids. The research also revealed the relationship between biological processes in watershed soils and soil acidification.

this example, it was found that rehabilitation was more complicated than simply damming gullies.

- Numerous water-quality studies of forested catchments have been summarized in a symposium proceedings. The information can be used to develop guidelines to protect water quality while harvesting and regenerating southern forests.

#### **Wildlife, Range, and Fish Habitat Research**

This research develops knowledge and technology to maintain or improve wildlife and fish habitat, improve range condition and productivity, improve soil stability and vegetation cover, and integrate wildlife, fish, and livestock with other forest and rangeland uses. Research results help managers understand the complex relationships among habitat quality, growth and response of vegetation to defoliation, other land uses, and wildlife and fish populations in order to ensure diverse, well-established habitats, productive rangeland ecosystems, and protection and improvement of forage and related resources. Examples of 1985 accomplishments follow.

- Scientists found that sometimes erosion processes must continue before a landscape can be stabilized. Research on the Alkali Creek Watershed in western Colorado showed that erosion of steep soil banks with high-sodium content and subsequent leaching of the sodium from the material deposited in the channel bottom were the key factors in stabilizing the watershed. In

*Forest Service research seeks to develop new management practices to improve the productivity of Intermountain rangelands.*



- A recently published book, "White-Tailed Deer: Ecology and Management," is the most comprehensive treatment of this species ever published. It has been acknowledged as the definitive volume on the white-tailed deer, covering deer biology and ecology, population management, habitat management, research, benefits, and management needs and opportunities.
- Published reports on salt-desert shrub rangelands and on the Benmore Experimental Range summarize the most important range management research findings for these areas over the past 40 to 50 years. The reports include descriptions of alternative management practices that are applicable to vast acreages of western rangelands.
- The Apache trout is one of the rarest trout in the West, limited to a few cool mountain streams in east-central Arizona. The trout's existence is threatened by habitat destruction, displacement by other species, and hybridization. Scientists have completed an extensive taxonomic survey of remaining strongholds of Apache trout. Study results will be used by the Apache Trout Interagency Recovery Team to help prevent loss of this unique fish.
- The Kirtland's warbler is an endangered species that is restricted to a small breeding range in northern lower Michigan. Habitat for this species must be created through timber-management activities. Counter to previously accepted practice, researchers have found

that burning off ground cover may not be necessary for regenerating Kirtland's warbler habitat. In fact, fire may have little influence on ground cover by the time the forest stands are mature enough for warbler occupancy.

#### **Forest Recreation Research**

The objectives of this activity are to provide Forest land managers with technology to supply more and higher quality outdoor recreation experiences, and to develop knowledge to manage vegetation in and near urban areas for optimum economic, social, and environmental benefits. Examples of 1985 accomplishments include:

- Scientists have developed the "Limits of Acceptable Change" (LAC) approach, which is a method that wilderness managers can use to determine the maximum number of recreational visits a wilderness area can sustain without suffering physical damage or reduction in the quality of user experience. The LAC approach defines the amount of change to be allowed, identifies management actions needed to prevent further change, and gives procedures to monitor and evaluate management performance.
- A study of people's evaluations of the desirability of various tree densities in two parks in the Chicago suburbs showed that most park users preferred tree densities of 50 to 65 per acre. This information can be used to guide urban tree replacement programs.

#### **Forest Products and Harvesting Research**

The objectives of this activity are to (1) provide technology to harvest and utilize timber more efficiently, (2) develop timber harvesting and transporting systems that are economical and environmentally acceptable, (3) improve the performance of wood

products, (4) expand opportunities for wood-products exports, (5) reduce costs and energy consumption in wood processing, and (6) facilitate forest management and environmental protection through improved harvesting and use of wood. Examples of 1985 accomplishments include:

- A land-management analytical technique has been developed for use in the northern Rocky Mountains to identify unstable slopes that have high potential for failure (landslide). The technique also provides alternative approaches that can be used to avoid or stabilize these areas. The method has been adopted to field application through use of hand-held, programmable computers.
- Research has shown that carbohydrate derivatives can replace up to 50 percent of the components in phenolic adhesives now used to bond wood-based panel products, such as plywood. Easily obtained from wood, from byproducts of wood manufacturing, or from other renewable biomass sources, carbohydrate derivatives can significantly reduce the use of petroleum-derived resins that have traditionally been used as adhesives for manufacturing of bonded wood products. Use of carbohydrate derivatives would significantly lower costs of manufacturing.

## INTERNATIONAL FORESTRY

The objective of the Forest Service International Forestry program (IF) is to provide leadership, coordination, and direction for Forest Service involvement in forestry worldwide. Examples of 1985 accomplishments follow.

- Leadership or staff support was provided to new bilateral agreements for forestry cooperation with other countries. Most notable are the agreements with the Soviet Union and Mexico.

- Work with other countries through cooperative research and science and technology exchanges was expanded. Cooperative research was undertaken jointly with 6 countries on 25 projects, and 15 scientific exchanges took place with 6 countries. Of particular benefit were the acquisition of new tree germplasm and information on atmospheric deposition.
- IF played an important role in redrafting and finalizing the Program for Tropical Forestry in Latin America and the Caribbean. This cooperative program among the Southern Region, the Southeastern and Southern Forest Experiment Stations, and the Forest Products Laboratory, and IF should be the major plan guiding Forest Service participation in the Caribbean region for years to come.
- The major activity with international organizations in 1985 was organization of American participation in the IX World Forestry Congress. IF was a principal impetus behind that participation, assisting the U.S. national committee and its 7 subcommittees during the 14 months prior to the Congress.
- Practical training programs were provided at various Forest Service units for more than 225 international visitors in forestry and related fields. Visitors included students and professionals from 33 countries throughout the world.
- Through IF, the Forest Service continues to support the Man in the Biosphere (MAB) program and to benefit from its programs. A symposium was held at which 21 MAB research projects were reviewed. These all were funded in past years by the MAB Research Consortium, all dealt with tropical forestry issues, and most were funded through MAB with Forest Service funding.

- IF helped to organize a Latin America Forestry Workshop sponsored by the International Union of Forestry Research Organizations (IUFRO). IF staff also assisted in preparing the program for the 18th IUFRO World Congress, to be held in Ljubljana, Yugoslavia, in September 1986.

Another important aspect of the Forest Service International Forestry program is the work done through the Forestry Support Program (FSP). The FSP is a joint effort by the Forest Service and the U.S. Agency for International Development (USAID). In 1985, FSP helped create three new programs to strengthen linkages with developing countries. These include (1) an agreement between USAID's Office of Foreign Disaster Assistance and USDA, (2) an agreement between USAID and USDA for technical assistance and development of long-term institutional linkages with Mexico, and (3) a new Forestry Technical Advisor position in the Caribbean island region, cost shared with USAID.

In addition, FSP established a Forest Market Development Specialist position in Quito, Ecuador; supported five U.S. graduate students in conducting tropical forestry research in Sri Lanka, Indonesia, Swaziland, Peru, and Ecuador; streamlined its roster of forestry and natural resources expertise to better respond to USAID needs; trained approximately 80 foresters in lesser developed countries in aspects of forest management; and provided timely announcements to the forestry community on international vacancies, grant opportunities, and publications of international importance.

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#### **FOREST RESEARCH**

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Table 1—Summary statement of receipts and expenditures—fiscal years 1984-85

	1985		1984		Percent change: 1984 to 1985
	Receipts	Expendi- tures	Receipts 1,000 constant 1985 dollars	Expendi- tures	
National Forest programs:					
Receipts:					
Cash receipts and appropriation expenditures:					
Sale of timber and use of other forest resources	571,692	0	620,964	0	-8
Use of National Grasslands and land utilization areas	64,255	0	39,967	0	61
Timber sale area betterment (K-V) 1/	186,107	0	171,585	0	8
Cooperative work for others	38,613	0	45,603	0	-15
Brush disposal	53,734	0	62,521	0	-14
Miscellaneous (sales, rentals, damages, etc.) 2/	6,332	0	15,824	0	-67
Restoration of forest lands and improvements	172	0	166	0	4
Recreation permit sales and fees from designated areas	2	0	4	0	-52
Timber salvage sales	15,232	0	21,273	0	-28
Operation & maintenance of quarters	4,854	0	0	0	+100
Subtotal	940,993	0	977,907	0	-4
Cash receipts from NFS lands collected in conjunction with, and deposited to, accounts of other agencies	82,421	0	88,630	0	-7
Noncash income (roads built by timber purchasers)	107,949	0	159,810	0	-32
Total	1,131,363	0	1,226,347	0	-8
Expenditures:					
Operating costs	0	1,630,665	0	1,619,811	0
Capital outlay 2/	0	218,842	0	181,881	0
Total	0	1,849,507	0	1,801,692	3
Other Forest Service programs:					
Forest Research programs:					
Forest research	0	118,790	0	117,538	0
Research construction	0	988	0	1,053	0
Cooperative research work	1,265	1,224	1,231	809	3
Gifts, donations, and bequests for forest rangeland research	36	9	0	8	100
Tongass timber supply fund	0	1,852	0	1,659	0
Energy security reserve	0	9	0	195	0
Federal photovoltaics utilization program	0	79	0	33	0
Subtotal	1,301	122,951	1,231	121,295	6
Total	1,301	122,951	1,231	121,295	1

Table 1—Summary statement of receipts and expenditures—fiscal years 1984-85—Continued

	1985		1984		Percent Change 1984 to 1985	
	Receipts	Expendi- tures	Receipts 1,000 constant 1985 dollars	Expendi- tures	Receipts	Expendi- tures
State and Private Forestry programs:						
State and private forestry cooperation	0	64,464	0	63,174	0	2
Rural community fire protection	0	3,234	0	3,344	0	-3
Flood prevention and watershed protection	0	1,918	0	2,126	0	-10
Licensee programs (Woodsy Owl and Smokey Bear)	74	33	193	34	-62	-4
Forestry incentives and other programs <sup>3/</sup>	0	2,360	0	2,944	0	-20
Subtotal	74	72,009	193	71,622	-62	1
Human Resource programs:						
Job Corps	0	52,166	0	57,722	0	-10
Senior Community Service Employment	0	21,638	0	21,457	0	1
Subtotal	0	73,804	0	79,179	0	-7
Grand total, all programs	1,132,738	2,118,271	1,227,771	2,073,788	-8	2
Cash receipts distributed to States, counties and Puerto Rico:						
Payments to States and Puerto Rico	0	224,937	0	199,841	0	13
Payment to Minnesota	0	716	0	738	0	-3
Payments to counties, National Grasslands and Land Utilization Areas	0	10,047	0	10,279	0	-2
Subtotal	0	235,700	0	210,858	0	12
Internal equipment and supply service (Working Capital)	91,491	81,065	120,581	98,386	-24	-18
Reimbursements for work performed for government and others included above	0	52,396	0	55,995	0	-6

- 1/ K-V = Knutson-Vandenberg  
2/ Includes Misc (sale, rents, etc.), sale of personal property, and Acquisitions of Lands to complete Land Exchanges.  
3/ Includes Resource Conservation and Development, River Basins, and Pesticide Impact assessment funds transferred from ARS.

**Table 2—Summary statement of values and expenditures—fiscal year 1985**

Item	Units <u>1/</u>	Quantity <u>1,000</u>	Average value per unit	Total value <u>million dollars</u>
<b>Value:</b>				
Minerals				
Common	Tons	-- <u>2/</u>	--	--
Locatable	Tons	--	--	--
Leasable <u>3/</u>	BBTU	637.2	2,011.7 <u>4/</u>	1,281.8
Timber	MBF	10,819.0	51.59 <u>5/</u>	558.2
Recreation <u>6/</u>	RVD	212,672.9	7.54 <u>7/</u>	1,603.6
Wilderness and primitive	RVD	12,734.4	12.78 <u>7/</u>	162.7
Wildlife and fish				
Recreation	RVD	32,000.0	18.78 <u>8/</u>	601.0
Commercial	Pounds	--	--	--
Range	AUM	8,794.7	6.82 <u>8/</u>	60.0
Water	AF	--	--	--
Total values				4,267.3
<b>Expenditures:</b>				
National Forest System				1,849.5
Forest Research				123.0
State and Private Forestry				72.0
Human Resource Programs				73.8
Total expenditures				2,118.3
Net value, total				2,149.0
Net value, National Forest System only				2,417.8

1/ BBTU = Billion British thermal units, MBF = thousand board feet, RVD = recreation visitor days, AUM = animal unit month, AF = acre feet.

2/ -- = not available.

3/ Oil, gas, and coal only.

4/ Average values for 1983 as provided by DOE, FS.

5/ Actual value at time of sale.

6/ Exclusive of wilderness, wildlife and fish.

7/ 1985 RPA program values.

8/ Revised 1985 RPA program values.

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Table 3—Statement of receipts—fiscal years 1981-85

Receipts	1985	1984	1983	1982	1981
	<u>1,000 dollars</u>				
Receipts from sale and use of forest resources:					
Timber and forest products	514,561	544,265	398,498	251,022	581,441
Grazing	9,040	9,618	10,183	12,426	14,889
Land uses	3,348	3,442	3,162	2,860	2,422
Recreation	30,829	27,541	27,801	25,352	19,416
Power	647	834	733	679	485
Minerals	77,522	51,649	54,932	57,885	62,080
Subtotal	635,947	637,349	495,309	350,224	680,733
Receipts from deposits for expenditures on National Forests:					
Timber sale area betterment	186,107	165,463	134,351	77,546	124,860
Timber salvage sales	15,232	20,514	14,106	6,822	11,884
Brush disposal	53,734	60,290	47,844	29,588	43,844
Restoration of Forest Service lands and improvements	172	160	214	56	97
Cooperative work	38,613	43,976	33,859	26,254	27,525
Operation & maint. of quarters	4,854				
Gifts, donations & bequests	36				
Subtotal	298,748	290,403	230,374	140,266	208,210
Other receipts:					
Misc. (sale, rents, etc.)	5,236	14,844	7,506	4,724	4,052
Golden Eagle passports	2	4	4	4	4
Sale of personal property	10	35	19	42	40
Cooperative research	1,265	1,187	1,702	1,003	1,079
Royalties from sale of Smokey Bear and Woodsy Owl products	74	186	70	54	96
Acquisition of lands to complete land exchanges	1,086	380	109	151	532
Subtotal	7,673	16,636	9,410	5,978	5,803

See footnotes at end of table.

Table 3—Statement of receipts—fiscal years 1981-85—Continued

Receipts	1985	1984	1983	1982	1981
			1,000 dollars		
Other income:					
Estimated collections by Dep. of Energy for power licenses on Public Domain National Forest land	543	618	411	1,004 <sup>2/</sup>	542
Estimated collections by Dep. of the Interior for mineral leases on Public Domain National Forest land	81,878	84,850	77,600	68,600	63,000
Value of roads built by timber purchasers in lieu of cash	107,949	154,108	153,203	164,128	189,559
Subtotal	190,370	239,576	231,214	233,732	253,101
Total	1,132,738	1,158,569	966,307	730,200	1,147,847
Other net deposits:					
Monies advanced on active timber sales:					
Bal. from previous year	213,853	264,534	143,580	231,450	268,574
Deposited current year	842,201	869,404	755,185	426,903	800,322
Trans. to other accounts	-863,874	-920,085	-634,231	-514,773	-837,446
Bal. on deposit	192,180	213,853	264,534	143,580	231,450
Amounts deposited pending disposition:					
Bal. from previous year	328	15,292	12,483	12,372	7,780
Deposited current year	34,012	9,709	9,862	20,226	21,317
Trans. to other accounts	-15,787	-24,673	-7,053	-20,115	-16,725
Bal. on deposit	18,553	328	15,292	12,483	12,372
Subtotal	210,733	214,181	279,826	156,063	243,822
Total	1,343,471	1,398,145	1,246,133	886,263	1,391,669

1/ Includes \$19 million adjusted windfall profit tax payment for 1980-84.

2/ Increase due to an additional billing made by Federal Energy Regulatory Commission.

Table 4—Statement of receipts—fiscal year 1985

Receipts	National Forests	Oregon and California grant lands	National Grasslands & L.U. areas 1/ 1,000 dollars	Other	Total
Receipts from sale and use of forest resources:					
Timber and forest products	498,547	16,011	3		514,561
Grazing	7,747	1	1,292		9,040
Land Uses	2,869	44	435		3,348
Recreation	30,826		3		30,829
Power	649		-2		647
Minerals	14,998		62,524		77,522
Subtotal	555,636	16,056	64,255		635,947
Receipts from deposits for expenditures on National Forests:					
Timber sale area betterment	186,107				186,107
Timber salvage sales	15,232				15,232
Brush disposal	53,734				53,734
Restoration of Forest Service lands and improvements	172				172
Cooperative work	38,613				38,613
Operation & maint. of quarters	4,854				4,854
Gifts, donations & bequests	36				36
Subtotal	298,748				298,748
Other receipts:					
Misc. (sale, rents, etc.)				5,236	5,236
Golden Eagle passports 2/				2	2
Sale of personal property 2/				10	10
Cooperative research				1,265	1,265
Royalties from sale of Smokey Bear and Woodsy Owl products				74	74
Acquisition of lands to complete land exchanges				1,086	1,086
Subtotal				7,673	7,673

See footnotes at end of table.

Table 4—Statement of receipts—fiscal year 1985—Continued

Receipts	National Forests	Oregon and California grant lands	National Grasslands & L.U. areas 1/ 1,000 dollars	Other	Total
Other income:					
Estimated collections by Dep. of Energy for power licenses on Public Domain National Forest land	543				543
Estimated collections by Dep. of the Interior for mineral leases on Public Domain National Forest land	81,878				81,878
Value of roads built by timber purchasers in lieu of cash	107,949				107,949
Subtotal	190,370				190,370
Total	1,044,754	16,056	64,255	7,673	1,132,738
Other net deposits:					
Monies advanced on active timber sales	213,853				213,853
Bal. from previous year	842,201				842,201
Deposited current year	-863,874				-863,874
Trans. to other accounts	192,180				192,180
Bal. on deposit					
Amounts deposited pending disposition	328				328
Bal. from previous year	34,012				34,012
Deposited current year	-15,787				-15,787
Trans. to other accounts	18,553				18,553
Bal. on deposit					
Subtotal	210,733				210,733
Grand total	1,255,487	16,056	64,255	7,673	1,343,471

1/ Land Utilization Projects.

2/ These receipts are credited to the Department of the Interior.

**Table 5—Statement of expenditures—fiscal year 1985**

	Total	Work for other public agencies (reimbursables)
		<u>1,000 dollars</u>
National Forest System:		
Protection and management	651,497	12,067
Fighting forest fires	166,700	5,209
Cooperative work for others	36,777	0
Cooperative law enforcement	6,887	0
Flood prevention and watershed protection	3,196	0
Restoration of forest lands and improvements	138	0
Reforestation and timber stand improvement <u>1/</u>	113,882	11
Timber sale betterment (K-V) <u>2/</u>	111,966	0
Brush disposal	36,840	3
Timber salvage sales	17,235	0
Oregon-California grant lands	47	0
Range betterment	3,794	0
Construction of facilities	31,964	-267
Acquisition of lands, Forest Service	729	0
Acquisition of lands, Land and Water Conservation Fund	31,839	534
Construction of forest roads and trails	234,288	1,979
Timber purchaser roads constructed by the Forest Service	8,485	0
Restoration of roads, Federal highway funds	11,722	0
Road and trail maintenance	74,124	495
Mount St. Helens emergency activities	173	0
Tongass timber supply fund	43,989	-3
General administration <u>3/</u>	259,377	937
Operation & Maintenance of Quarters	3,858	0
Subtotal	1,849,507	20,965
Research:		
Tongass timber supply fund	1,852	0
Forest research	118,790	5,159
Construction of research facilities	988	0
Cooperative research	1,224	0
Energy security reserve, DOE	9	0
Federal photovoltaics utilization program, DOE	79	80
Gifts, donations, and bequests for forest and rangeland research	9	0
Subtotal	122,951	5,239

See footnotes at end of table.

**Table 5—Statement of expenditures—fiscal year 1985—Continued**

	Total	Work for other public agencies (reimbursables) <u>1,000 dollars</u>
State and Private Forestry:		
Cooperation and general forestry assistance	64,464	4,083
Resource conservation and development	792	0
Rural community fire protection grants	3,234	0
River basins	1,084	0
Flood prevention and watershed planning	1,918	0
Licensee programs (Smokey Bear and Woodsy Owl)	33	0
FIP, ACP, and miscellaneous	484	0
Subtotal	72,009	4,083
Human Resource Programs:		
Job Corps	52,166	471
Senior citizens and miscellaneous	21,638	21,638
Subtotal	73,804	22,109
Total	2,118,271	52,396
Internal equipment and supplies service:		
Working Capital Fund	81,065	81,065
Grand total	2,199,336	133,461

1/ Includes obligations of \$47,636,945 for Reforestation Trust Fund.

2/ K-V = Knutson-Vandenberg Act.

3/ General administration also supports activities in Forest Research,  
State and Private Forestry, Construction, and Land Acquisition.

**Table 6—Statement of expenditures—fiscal years 1981-85**

	1985 <u>1/</u>	1984 <u>1/</u>	1983 <u>1/</u>	1982 <u>1/</u>	1981
	<u>Million dollars</u>				
National Forest System	1,849.5	1,737.4	1,715.0	1,600.1	1,967.1
Forest Research	123.0	117.0	114.1	118.6	141.7
State and Private Forestry	72.0	69.0	72.6	75.2	94.1
Human Resource Programs	73.8	76.4	72.4	88.5	134.2
Working Capital Fund	81.0	94.9	86.5	111.0	91.3
Total <u>2/</u>	2,199.3	2,094.7	2,060.6	1,993.4	2,428.5

1/ All general administration expenditures are included in National Forest System for 1982-85; for past years they are included in each line item.

2/ Columns may not add due to rounding.

**Table 7—Distribution of employees by program and occupational category—  
selected fiscal years**

	1985	1984 1/	1983	1980	1975
Research:					
Clerical	526	468	571	627	460
Technical	1,082	942	1,042	968	528
Administrative	241	215	241	302	246
Professional	1,253	1,099	1,240	1,452	1,408
Subtotal	3,102	2,724	3,094	3,349	2,642
State and Private Forestry:					
Clerical	46	52	58	163	81
Technical	41	37	30	80	31
Administrative	26	23	23	42	28
Professional	110	109	120	347	256
Subtotal	223	221	231	632	396
National Forest System:					
Clerical	4,849	4,947	5,312	6,361	6,411
Technical	26,158	25,143	25,761	30,036	28,774
Administrative	3,073	2,519	2,777	2,370	1,860
Professional	9,533	9,750	9,988	9,082	7,562
Subtotal	43,613	42,359	43,838	47,849	44,607
Total	46,938	45,304	47,163	51,830	47,645
Full-time equivalents	38,524	40,134	41,850	49,005	30,123

1/ Figures revised based on updated data available after the 1984 Report of the Forest Service was published.

**Table 8—Distribution of employees by tour of duty as reported in July of selected years**

	1985	1984 1/	1983	1980	1975
Permanent full-time	29,211	30,030	30,752	21,421	19,568
Other permanent	3,713	3,965	5,325	15,815	12,115
Temporary	15,019	15,225	14,899	24,043	18,076
Total	47,943	49,220	50,976	61,279	49,759

1/ Figures revised based on updated data available after the 1984 Report of the Forest Service was published.

Table 9—Summary of Forest Service Human Resource Programs—fiscal year 1985

Program	Program funding Million dollars	Value of work accom- plished	Persons served	Percent		Person years accom- plished	Percent placement	Return per dollar invested
				Women	Minority			
Youth Conservation Corps 1/	3.2	4.5	2,293	44	15	374	-- 2/	1.41
Job Corps 3/	50.0	19.1	8,664	10	54	3,825	80	--
Senior Community Service Employment Program 3/	21.0	33.1	6,202	39	24	2,833	13	1.58
Volunteers in the National Forests 4/	Unfunded	22.5	45,907	33	9	1,787	--	--
Hosted programs	Unfunded	8.7	8,603	16	40	741	--	--
Total	78.6	87.9	71,669	--	--	9,560	--	--

1/ Funds were not directly appropriated for Youth Conservation Corps; the program operated at \$3.7 million as authorized in the 1985 Appropriations Act.

2/ -- = not applicable.

3/ Statistics are for the July 1, 1984, through June 30, 1985, program year.

4/ Statistics include the Touch America Project (TAP).

Table 10—Summary of National Forest System accomplishments compared to  
funded output levels and 5-year average—fiscal year 1985

Resource Area	Activity	Unit of Measure	1/ Funded	1985		Percent of funded	1981-85 average accomplishment	as percent of 5-year average
				Accomplished	Funded			
Resource: Recreation Wilderness Wildlife and fish Range Timber	Visitor use	MM RVD's	240.0	225.4		94	232.9	97
	Maintenance	MM acres	32.1	32.1		100	26.5	121
	Habitat improvement <u>2/</u>	M acres	332.2	355.2		107	358.2	99
	Permitted grazing use	MM AUM's	9.8	10.1		103	9.9	102
	Sales offering	B bd.ft.	11.2	11.5		103	11.5	100
	Silvicultural exams	MM acres	5.7	6.1		109	6.5	94
	Reforestation							
	Appropriated funds	M acres	172.3	175.2		102	197.1	99
	K-V funds <u>3/</u>	M acres	203.1	194.6		96	186.6	104
	Timber stand improvement							
Soil and water Minerals	Appropriated funds	M acres	287.2	300.5		105	261.0	115
	K-V funds	M acres	122.6	120.9		99	124.3	97
	Resource improvement <u>4/</u>	M Acres	4,612	6,981		151	6,391.2	109
	Leases and permits	Cases	22,318	28,488		128	26,885.8	106
Support:	Trail construction/reconstruction	Miles	663	721		109	462.8	156
	Road construction							
	Appropriated funds	Miles	1,649	1,903 <u>5/</u>		115	1,683.4	113
	Purchaser credit <u>6/</u>	Miles	7,165	6,184		86	7,048.2	88
	Fuel management <u>7/</u>	M acres	229.2	266.7		116	286.0	93
	Land acquired							
	Purchase and donation	M acres	32.2	46.9		146	73.0	64
	Exchanges	M acres	117.2	119.0		102	137.8	86
	Landline location <u>8/</u>	Miles	5,402	5,945		110	6,188.2	91

1/ M = thousand, MM = million, B = billion.

2/ Includes 197,394 acres accomplished with Knutson-Vandenberg funds in 1984; and a 1981-85 average of 132,229 acres.

3/ K-V = Knutson-Vandenberg Act.

4/ Does not include 3,858 acres accomplished with K-V funds in 1985; and a 1982-85 average of 4,472 acres.

5/ Includes 44.9 Tongas Timber Supply miles.

6/ Includes 473 miles turned back to Forest Service in 1985; and a 1981-85 average of 870 miles.

7/ Does not include 3,941 acres accomplished through human resource programs and 359,826 acres with brush disposal funds. The 1981-85 average was 8,315 acres accomplished through human resource programs and 431,156 acres using brush disposal funds.

8/ Does not include landline maintenance as previously established but deteriorating landlines.

**Table 11—National Forest System funding—fiscal year 1985 compared to 1981-85 average**

	1985		1981-85 average	Percent of actual to average
	Actual	RPA 1/ 1,000 constant 1985 dollars 2/		
Minerals area management	26,572	35,991	29,150	91
Land management	20,836	52,896	27,349	76
Landline location	29,090	48,539	36,228	80
Maintenance of facilities	14,792	32,588	19,947	74
Forest fire protection	156,591	206,994	203,224	77
Fighting forest fires	62,227	1,000	75,521	82
Cooperative law enforcement	7,212	11,065	6,902	104
Forest road maintenance	65,406	99,803	89,902	73
Forest trail maintenance	9,256	19,351	15,006	62
Sales administration and management	194,702	228,477	232,583	84
Reforestation and stand improvement 3/	104,664	116,660	142,050	70
Recreation use	102,057	231,614	130,788	78
Wildlife and fish habitat management	36,726	50,788	46,036	80
Range management	28,170	44,484	36,673	77
Soil and water management	31,808	44,824	41,550	77
Subtotal	890,109	1,225,074	1,132,906	78
General administration	258,844	321,173	350,050	74
Mount St. Helens 4/	0	--	(2,688)	(0)
Youth Conservation Corps 4/	(3,234)	--	3,637	89
Construction and land acquisition:				
Construction of facilities 5/	26,228	103,090	36,150	73
Forest road construction	228,914	325,551	294,678	78
Forest trail construction	7,093	16,420	6,605	107
Forest roads purchaser construction 6/	(192,301)		(244,475)	
Mount St. Helens 4/	(0)	--	0	0
Chugach Natives, Inc. 4/	(0)	--	0	0
Subtotal	262,235	455,061	337,433	78

See footnotes at end of table.

**Table 11—National Forest System funding—fiscal year 1985 compared to 1981-85 average—Continued**

	1985		1981-85 average	Percent of actual to average
	Actual	RPA 1/ 1,000 constant 1985 dollars		
Land acquisition	50,535	161,640	58,426	87
Acquisition of lands for Winema NF	0	--	73	0
Acquisition of lands for National Forests, special acts	766	843	1,025	75
Acquisition of lands to complete land exchange	42	--	335	6
Appropriated trust fund	35	--	120	73
Range betterment	3,966	5,200	7,403	54
Permanent appropriations	393,634	440,447	506,440	76
Trust funds	172,541	228,814	226,040	76
Total 7/	2,016,267	2,828,255	2,621,973	77

1/ Items not included in RPA are marked "--".

2/ Survey of Current Business (BEA) index values used for 1981-1984. BEA updates GNP implicit price deflators periodically. These are current as of December 1985.

3/ Includes reforestation trust fund.

4/ Funds provided for unique circumstances, and are not included in comparison.

5/ Excludes construction of research facilities, which is included in Table 63.

6/ This account was taken off budget in 1982. For comparison, the amounts are shown as non-add items.

7/ Excludes Mount St. Helens and Chugach Natives appropriations which were for unique circumstances and forest roads purchaser construction, which was taken off budget in 1982.

Table 12—National Forest System funding—fiscal years 1981-85

	1985	1984	1983	1982	1981 1/
	1,000 dollars				
Minerals area management	26,572	25,670	22,598	18,691	15,175
Land management	20,836	18,709	19,935	20,636	20,547
Landline location	29,090	29,448	25,034	25,011	25,341
Maintenance of facilities	14,792	14,070	21,710	11,833	11,523
Forest fire protection	156,591	156,734	153,889	142,235	141,092
Fighting forest fires	62,227	35,301	1,000 2/	69,004	104,275
Cooperative law enforcement	7,212	5,175	5,174	3,734	4,411
Forest road maintenance	65,406	64,650	73,666	65,286	62,473
Forest trail maintenance	9,256	9,267	13,988	11,312	11,226
Sales administration and management	194,702	187,547	162,125	161,244 3/	155,485
Reforestation and stand improvement 4/	104,664	85,582	161,963	95,611	82,911
Recreation use	102,057	100,919	99,774	91,180	89,363
Wildlife and fish habitat management	36,726	35,360	33,349	33,136	31,542
Range management	28,170	27,267	27,031	27,287	25,566
Soil and water management	31,808	29,956	28,713	32,015	30,558
Subtotal	890,109	825,655	849,949	808,214	811,488
General administration	258,844	259,865	260,915	242,290	267,097
Mount St. Helens 5/	(0)	(0)	(0)	(0)	(13,442)
Youth Conservation Corps 6/	(3,234) 8/	(3,500) 5/	3,400	(1,600) 5/	(4,900) 5/
Construction					
Construction of facilities 7/	26,228	23,445	51,007	17,465	16,389
Forest road construction	228,914	222,675	245,169	236,204	159,303
Forest trail construction	7,093	5,182	4,936	4,038	3,443
Forest roads purchaser construction 8/	(192,301)	(240,000)	(240,000)	(242,542)	(210,000)
Mount St. Helens 5/	(0)	(0)	(0)	(0)	(22,607)
Chugach Natives, Inc. 5/	(0)	(0)	(9,000)	(3,000)	(0)
Subtotal 9/	262,235	251,302	301,112	257,707	179,135

See footnotes at end of table.

Table 12—National Forest System funding—fiscal years 1981-85—Continued

	1985	1984	1983	1982	1981 1/
	1,000 dollars				
Land acquisition	50,535	40,075	63,077 10/	26,262	37,015
Acquisition of lands for Winema NF	0	281	0	0	0
Acquisition of lands for National Forests, special acts	766	780	753	724	754
Acquisition of lands to complete land exchange	42	380	109	151	532
Appropriated trust fund	35	90	90	84	90
Range betterment	3,966	4,028	5,378	6,583	6,940
Permanent appropriations	393,634	382,154	296,819	365,454	432,493
Trust funds	172,541	231,103	169,937	111,904	153,465
Total 9/	2,094,791	1,995,713	1,951,539	1,819,373	1,889,009

- 1/ In order that a comparison may be made with 1982-85, general administration has been eliminated from individual line items and shown as a separate entry.
- 2/ The Forest Service did not receive a supplemental fire appropriation in 1983. Under a new procedure, actual expenses will be reimbursed the following year.
- 3/ Does not include \$1,407 thousand reprogrammed from Helistat to Gypsy moth.
- 4/ Includes reforestation trust fund.
- 5/ Funds provided for unique circumstances and are not included in comparison.
- 6/ 1981 Account transferred to USDI. Forest Service operated a \$4.9 million transfer program. 1982 - operated a \$1.6 million program from available funds. 1983 - \$10 million appropriated. Forest Service portion \$3.4 million. 1984 - operated a \$3.5 million program from available funds. 1985 - operated a \$3.2 million program from available funds.
- 7/ Excludes construction of research facilities, which is included in Table 63.
- 8/ This account was taken off budget in 1982. For comparison, the amounts are shown as non-add items.
- 9/ Excludes Mount St. Helens and Chugach Natives appropriations, which were for unique circumstances, and forest roads purchaser construction, which was taken off budget in 1982.
- 10/ Includes \$6.2 million transferred from National Park Service.

Table 13—Summary of National Forest System accomplishments compared to RPA goals—fiscal year 1985

Resource area	Activity	Unit of measure	1985			1981-85 average		
			RPA goal	Accomplished	Percent of RPA	RPA goal	Accomplished	Percent of RPA
Final output 2/								
Timber Recreation Range Minerals	Sales offering	B bd. ft.	12.5	11.5	92	12.1	11.6	96
	Visitor use	MM RVD's	255.0	225.4	88.4	237.6	230.0	97
	Permitted grazing use	MM AUM's	10.1	10.1	100	10.0	10.0	100
	Applications, proposals and administration	Cases 3/	24	28.5	119	21.0	28.1	134
Intermediate output 4/								
Timber  Wildlife Wilderness Soil and water Trails	Reforestation	M acres	470	369.8	79	465.8	382.6	82
	Timber stand improvement	M acres	408	421.4	103	396.0	387.6	98
	Habitat improvement	M acres	655 5/	355.2 6/	54	564.6 5/	362.8 6/	64
	Maintenance	MM acres	41	32.1	78	38.8	26.5	68
Roads  Fire Lands	Resource improvement	M acres	33	12.1 7/	34	26.5	12.3 8/	46
	Construction/reconstruction	Miles	2,127	721.0	34	1,898.6	474.4	25
	Fuel management 10/	M Acres	13,601 9/	8,042	59	13,186.4	8,586.2	65
	Purchase and donation	M acres	222	46.9	21	183.6	68.5	37

1/ M = thousand, MM = million, B = billion.

2/ Final output = Forest and rangeland goods and services purchased or consumed by the private sector or individual consumers. 3/ Reported as operating plans in the RPA.

4/ Intermediate output = Work performed by the Forest Service which contributes to the production of final outputs.

5/ RPA goal for 1985 was 3,275 acre equivalents, which is approximately 655 acres, the RPA 1981-85 average was 2,724 acre equivalents which is approximately 565 acres.

6/ Includes 197,394 acres accomplished with Knutson-Vandenberg funds in 1985; and a 1981-85 average of 132,229 acres.

7/ Includes 3,858 acres accomplished with K-V and other funds in 1985.

8/ Average for 1982-85; 1981 data not available. Includes a 1982-85 average of 4,472 acres accomplished with K-V and other funds.

9/ Represents a projection of miles constructed/reconstructed for all roads; and is contingent on planned resource outputs for 1985.

10/ Does not include 3,941 acres accomplished through human resource programs and 359,826 acres with brush disposal funds.

The 1981-85 average was 8,315 acres accomplished through human resource programs and 431,156 using brush disposal funds.

**Table 14—Draft and final forest plan environmental impact statements filed with the Environmental Protection Agency by Region as of September 30, 1985**

Northern Region	Rocky Mountain Region	Southwestern Region	Intermountain Region
<u>Drafts</u>	<u>Drafts</u>	<u>Drafts</u>	<u>Drafts</u>
Flathead(MT)	Bighorn(WY)	Carson(NM)	Caribou(ID)
Lewis & Clark(MT)	Medicine Bow(WY)	Gila(NM)	Targhee(ID)
Beaverhead(MT)	Shoshone(WY)	Coronado(AZ)	Toiyabe(NV)
Helena(MT)		Lincoln(NM)	Humboldt(NV)
Lolo(MT)	<u>Final</u>	Coconino(AZ)	Ashley(UT)
Nezperce(MT)			Fishlake(UT)
Bitterroot(MT)	Arapaho-Roosevelt(CO)	<u>Final</u>	Sawtooth(ID)
Gallatin(MT)	Grand Mesa, Uncompagne,		Dixie(UT)
Custer(MT)	and Gunnison(CO)	Cibola(NM)	Manti-LaSal(UT)
Deerlodge(MT)	Routt(CO)	Tonto(AZ)	Salmon(ID)
Idaho Panhandle(ID)	San Juan(CO)		Payette(ID)
Clearwater(ID)	Black Hills(SD)		Challis(ID)
Kootenai(MT)	White River(CO)		<u>Final</u>
	Pike-San Isabel(CO)		Unita(UT)
	Nebraska(NB)		Wasatch-Cache(UT)
	Rio Grande(CO)		Targhee(ID)
Pacific Southwest Region	Pacific Northwest Region	Southern Region	Eastern Region
<u>Draft</u>	<u>Draft</u>	<u>Draft</u>	<u>Draft</u>
Cleveland(CA)	None	George Washington(VA)	White Mountain(NH)
Angeles(CA)		Nantahala-Pisgah(NC)	Nicolet(WS)
Tahoe(CA)		Caribbean(PR)	Superior(MN)
Plumas(CA)		Cherokee(TN)	Monongahela(WV)
Stanislaus(CA)		Ozark-St. Francis(AR)	Chippewa(MN)
Lake Tahoe Basin		Florida(FL)	Allegheny(PA)
Management Unit(CA)		Ouachita(AR)	Huron-Manistee(MI)
Sequoia(CA)		Alabama(AL)	Chequamegon(WI)
San Bernardino(CA)		Croatan-Uwharrie(NC)	Mark Twain(MO)
Lassen(CA)		Texas(TX)	Hiawatha(MI)
Los Padres(CA)			Shawnee(IL)
Shasta-Trinity(CA)		<u>Final</u>	Ottawa(MI)
		Francis Marion(SC)	Green Mountain(VM)
		Sumter(SC)	<u>Final</u>
<b>Alaska Region</b>		Mississippi(MS)	Hoosier
<u>Final</u>		Kisatchie(LA)	
Chugach(AL)		Chattahoochee-	
		Oconee(GA)	
		Daniel Boone(KY)	
		Jefferson(VA)	

1/ Includes Forest plans filed in previous years.

**Table 15—Planned and approved minerals cases by Region—  
fiscal year 1985**

Region	RPA goal	Cases	
		Planned	Accomplished
Northern	3,407	4,449	4,551
Rocky Mountain	1,800	1,743	3,050
Southwestern	1,629	1,580	2,775
Intermountain	3,000	3,128	3,164
Pacific Southwest	1,400	1,963	2,482
Pacific Northwest	7,550	3,675	4,560
Southern	3,700	2,453	3,890
Eastern	1,410	2,443	3,095
Alaska	245	884	921
Total	24,141	22,318 <u>1/</u>	28,488

1/ 21,496 was original 1985 target allocation.

**Table 16—Energy mineral workload and production—fiscal years 1981-85**

Fiscal year	Acres under lease	Energy-related cases	Energy-related cases in inventory	Oil production	Gas production	Coal production
	Millions			Barrels	1,000 cubic feet	Short tons
1981	25.2	15,037	5,200	13,350,000	214,100,000	12,400,000
1982	25.0	16,380	7,200	13,000,000	214,000,000	13,000,000
1983	34.4	15,940	4,400	13,000,000	205,000,000	14,300,000
1984	34.0	13,103	2,805	12,000,000	205,000,000	15,100,000
1985 <u>1/</u>	33.3	15,473	3,533 <u>2/</u>	13,000,000	217,000,000	15,600,000

1/ All figures are estimated.

2/ Estimate includes 1,215 unprocessed lease applications in areas where wilderness considerations are pending.

**Table 17—Land acquisition and exchange—fiscal year 1985**

	Acres	Cases	Value
			<u>Million dollars</u>
Purchase	34,910	426	32.0
Exchange	118,996	137	78.0
Donation	11,946	23	24.3 <u>1/</u>
<b>Total</b>	<b>165,852</b>	<b>586</b>	<b>134.3</b>

1/ Includes the Redfield Estate on the Toiyabe National Forest, which was a transfer of lands to the United States in lieu of payment of estate taxes.

**Table 18—Miles of landline location by Region—fiscal year 1985**

Region	Total boundary	1985 accomplishment	Accomplished to date
Northern	30,664	605	4,813
Rocky Mountain	51,433	468	3,235
Southwestern	19,991	283	5,149
Intermountain	28,659	410	3,343
Pacific Southwest	29,577	1,247	8,008
Pacific Northwest	25,627	1,024	10,646
Southern	42,280	1,057	33,428
Eastern	42,642	810	5,952
Alaska <u>2/</u>	1,536	41	772
<b>Total</b>	<b>272,409</b>	<b>5,945</b>	<b>75,346</b>

1/ In addition, in fiscal year 1985 landline maintenance was completed on 2,616 miles of previously established but deteriorating landlines.

2/ Does not reflect changes due to Alaska Native Claims Settlement Act of 1971 (85 Stat. 688), as amended, and the Alaska Statehood Act of 1958 (72 Stat. 339), as amended. Because the land selections are overlapping and/or in a constant state of change, the Region is not keeping track of the boundary changes at this time.

**Table 19—Lands administered by the Forest Service as of September 30, 1985**

State, Commonwealth, or Territory 1/	National Forests, pur- chase units, research areas, and other areas	National Grasslands Acres	Land Utilization Projects	Total
Alabama	646,533	0	40	646,573
Alaska	22,842,205	0	0	22,842,205
Arizona	11,273,277	0	0	11,273,277
Arkansas	2,480,435	0	0	2,480,435
California	20,463,136	0	19,222	20,482,358
Colorado	13,823,585	611,930	560	14,436,075
Connecticut	24	0	0	24
Florida	1,099,121	0	0	1,099,121
Georgia	857,887	0	9,340	867,227
Hawaii	1	0	0	1
Idaho	20,380,728	47,746	0	20,428,474
Illinois	262,701	0	0	262,701
Indiana	188,540	0	284	188,824
Kansas	0	108,177	0	108,177
Kentucky	680,410	0	0	680,410
Louisiana	599,017	0	0	599,017
Maine	50,977	0	260	51,237
Michigan	2,762,969	0	959	2,763,928
Minnesota	2,804,830	0	0	2,804,830
Mississippi	1,147,077	0	0	1,147,077
Missouri	1,457,206	0	13,104	1,470,310
Montana	16,798,395	0	0	16,798,395
Nebraska	257,513	94,332	0	351,845
Nevada	5,160,396	0	0	5,160,396
New Hampshire	705,798	0	0	705,798
New Mexico	9,188,773	136,412	240	9,325,425
New York	13,232	0	0	13,232
North Carolina	1,216,503	0	0	1,216,503
North Dakota	796	1,104,968	0	1,105,764
Ohio	178,225	0	0	178,225
Oklahoma	248,965	46,300	0	295,265
Oregon	15,491,651	111,379	856	15,603,886
Pennsylvania	510,690	0	0	510,690
Puerto Rico	27,846	0	0	27,846
South Carolina	608,969	0	0	608,969
South Dakota	1,134,206	862,809	0	1,997,015
Tennessee	626,748	0	0	626,748
Texas	634,222	117,542	0	751,764
Utah	8,046,340	0	0	8,046,340
Vermont	297,265	0	0	297,265
Virgin Islands	147	0	0	147
Virginia	1,635,566	0	0	1,635,566
Washington	9,055,356	0	738	9,056,094
West Virginia	977,343	0	0	977,343
Wisconsin	1,505,567	0	120	1,505,687
Wyoming	8,682,764	571,836	0	9,254,600
Total	186,823,935	3,813,431	45,723	190,683,089

1/ States not listed have no lands administered by the Forest Service.

**Table 20—Fuels treatment acreage accomplished by appropriation—fiscal year 1985**

Region	RPA goal	Accomplishment			Total
		Forest fire protection funds	Volunteer and Contributed work	Brush disposal funds	
Northern	33,600	9,566	193	47,628	57,387
Rocky Mountain	41,300	4,884	53	5,640	10,577
Southwestern	50,000	42,488	40	48,530	91,058
Intermountain	19,500	0	10	25,609	25,619
Pacific Southwest	44,900	25,924	3,430	46,466	75,820
Pacific Northwest	38,600	28,773	105	182,752	211,630
Southern	105,400	152,497	63	0	152,560
Eastern	3,700	2,599	47	3,132	5,778
Alaska	0	0	0	69	69
Total	337,000	266,731	3,941	359,826	630,498

**Table 21—Timber offered, sold, and harvested—fiscal years 1981-85**

	1985 <u>1/</u>	1984	1983	1982	1981
Offered:					
Volume (billion board feet)	11.5	11.9	11.3	11.1	12.2
Sold:					
Number of sales <u>2/</u>	366,874	342,964	235,585	143,723	92,041
Volume (billion board feet)	10.8	10.7	11.1	10.0	11.5
Value (million dollars) <u>3/</u>	558.2	698.7	774.4	614.2	1,767.7
Harvested:					
Volume (billion board feet)	10.9	10.5	9.2	6.7	8.0
Value (million dollars) <u>4/</u>	720.6	759.6	649.6	339.7	720.9

1/ Preliminary.

2/ This is the number of sales that can be converted to board feet. Not included are 225,493 sales of nonconvertible product in FY 1985.

3/ This is the high bid value from all sales sold and includes stumpage, cost of reforestation, stand improvement, and timber salvage. Does not include value of roads or brush disposal.

4/ This is the current stumpage rate for the actual volume harvested and includes the reforestation and stand improvement costs and timber salvage. Does not include value of roads or brush disposal.

Table 22—Timber offered, sold, and harvested by Region—fiscal years 1983-85

	1985			1984			1983		
	Offered 1/	Sold 2/	Harvested 3/	Offered 1/	Sold 2/	Harvested 3/	Offered 1/	Sold 2/	Harvested 3/
	Million board feet								
Northern	1,043.6	937.9	944.4	1,102.5	917.1	968.5	1,079.8	1,125.2	947.5
Rocky Mountain	488.0	490.3	392.7	495.4	414.0	339.5	375.9	338.2	306.2
Southwestern 4/	438.7	342.8	394.5	510.8	363.4	387.3	457.4	413.7	318.0
Intermountain 4/	432.2	379.7	433.6	457.9	396.1	380.1	428.0	370.4	361.8
Pacific Southwest	1,628.6	1,679.9	1,664.3	1,734.8	1,457.7	1,657.5	1,736.1	1,865.5	1,490.3
Pacific Northwest	4,679.2	4,752.5	4,760.3	4,925.7	4,962.1	4,538.9	4,746.3	4,915.6	3,868.2
Southern	1,551.8	1,412.2	1,382.0	1,423.5	1,324.9	1,275.4	1,309.6	1,318.6	1,096.0
Eastern 4/	840.8	782.0	737.5	810.4	774.1	740.0	681.3	632.2	604.5
Alaska 4/	433.5	41.7	232.0	477.5	52.3	261.5	469.0	82.0	251.5
TOTAL 5/	11,536.4	10,819.0	10,941.3	11,938.5	10,661.7	10,548.7	11,283.4	11,061.4	9,244.0

1/ Sales volume offered for the first time.

2/ Does not include the volume of long-term sales released for harvesting. Includes miscellaneous small sales that were previously offered and/or sold and were reoffered and sold in the fiscal year being displayed.

3/ Includes the volume harvested on long-term sales.

4/ Includes long-term sales volume prepared in the offered column.

5/ Columns may not add due to rounding.

Table 23—Number of sales, volume, and value of timber sold on National Forest lands by size class—fiscal years 1981-85

		Sale Size Class							Total Less Non- convertibles 3/
		To \$300	\$301- \$2,000	\$2,001- 2,000MBF 1/	2,001- 5,000MBF	5,001- 15,000MBF	15,001MBF and over	Noncon- vertibles 2/	
1981	Number of sales	84,675	3,952	2,114	556	640	104	213,091	92,041
	Volume (MBF)	359,040	427,385	1,314,813	1,791,408	5,602,699	1,961,455	0	11,456,800
	Value (\$1,000)	2,913.2	8,823.3	113,111.7	206,064.3	1,077,314.0	359,522.8	1,624.1	1,767,749.4
1982	Number of sales	131,498	8,805	2,223	605	500	92	216.9	143,723
	Volume (MBF)	441,078	415,776	1,358,642	1,881,008	4,266,677	1,666,455	0	10,029,636
	Value (\$1,000)	3,580.3	8,365.4	82,587.9	139,849.1	292,693.0	87,112.2	1,755.2	614,187.9
1983	Number of sales	226,181	5,684	2,499	574	563	84	214,429	235,585
	Volume (MBF)	769,628	455,864	1,483,998	1,896,965	4,888,337	1,566,605	0	11,061,397
	Value (\$1,000)	5,081.3	9,116.0	97,819.5	132,413.9	421,334.7	108,605.1	1,715.7	774,370.5
1984	Number of sales	330,252	8,693	2,834	619	555	53	206,869	343,006
	Volume (MBF)	903,189	379,271	1,634,609	2,085,355	4,711,844	947,429	0	10,661,698
	Value (\$1,000)	5,599.1	7,262.7	103,076.2	149,605.1	372,807.1	60,368.0	1,581.7	698,718.2
1985	Number of sales	348,999	13,563	3,113	562	595	42	225,493	366,874
	Volume (MBF)	830,237	589,475	1,698,402	1,868,425	5,063,888	768,564	0	10,818,991
	Value (\$1,000)	5,810.1	8,562.2	80,568.9	100,221.6	314,475.0	48,547.3	1,662.7	558,192.1

1/ MBF = thousand board feet

2/ Nonconvertible products include Christmas trees, cones, burls, etc.

3/ May not add due to rounding.

Table 24--Timber sold and harvested, by State--fiscal year 1985

State or Commonwealth 2/	Timber sold			Timber harvested 3/	
	Sales	Volume	Value 4/	Volume 5/	Value 4/
		MBF 6/	1,000 dollars	MBF	1,000 dollars
Alabama	243	85,824	5,116,746	87,911	6,737,027
Alaska	82	41,664	367,134	232,035	(2,841,177)
Arizona	31,136	257,080	6,841,215	252,985	12,357,273
Arkansas	4,355	224,793	11,640,269	212,830	15,651,699
California	78,615	1,688,906	88,638,213	1,675,131	120,581,256
Colorado	27,718	287,641	2,295,247	201,217	1,987,971
Florida	128	121,913	8,003,080	111,203	8,722,028
Georgia	298	54,830	3,170,873	45,867	2,272,851
Idaho	39,890	653,371	16,050,454	737,236	23,085,341
Illinois	83	7,810	153,964	5,953	156,670
Indiana	382	10,359	466,644	7,688	371,489
Kentucky	931	39,897	824,748	28,906	702,110
Louisiana	2,171	207,044	8,828,377	216,966	13,968,283
Maine	11	10,582	348,250	2,859	50,854
Michigan	1,343	221,581	3,389,908	205,339	3,209,820
Minnesota	450	148,110	1,323,954	174,151	2,340,134
Mississippi	1,220	221,301	17,518,971	223,275	21,721,540
Missouri	3,710	74,769	2,852,254	70,031	2,239,031
Montana	18,865	541,667	11,790,096	496,331	13,193,577
Nebraska	356	2,017	8,929	351	2,142
Nevada	1,502	4,110	55,013	1,976	24,770
New Hampshire	62	35,542	737,297	29,487	702,450
New Mexico	24,805	85,748	1,050,151	141,540	2,706,687
New York	68	897	35,892	684	4,457
North Carolina	542	66,011	1,173,396	68,802	2,089,999
North Dakota	137	90	1,750	91	1,767
Ohio	362	12,089	642,185	11,300	443,597
Oklahoma	265	23,233	1,082,934	40,191	2,708,321
Oregon	54,113	3,467,721	273,946,194	3,544,390	356,986,117
Pennsylvania	193	61,259	5,615,534	58,430	7,315,591
South Carolina	268	114,953	8,901,835	106,544	9,017,909
South Dakota	244	81,876	829,548	107,470	2,129,415
Tennessee	294	37,415	1,290,436	34,667	948,896
Texas	1,529	139,343	7,382,093	131,579	10,187,528
Utah	26,089	95,198	959,159	79,182	848,189
Vermont	197	13,133	204,272	13,072	326,681
Virginia	1,186	73,287	982,658	69,078	809,660
Washington	28,892	1,279,887	58,974,419	1,222,978	71,856,324
West Virginia	1,201	33,022	886,117	22,743	584,833
Wisconsin	232	155,183	2,513,402	139,880	2,232,054
Wyoming	12,706	137,835	1,298,524	128,922	2,201,001
Total 7/	366,874	10,818,991	558,192,135	10,941,271	720,636,165

1/ Excludes nonconvertible products such as Christmas trees, cones, burls, etc.

2/ States not listed had no timber sold or harvested in fiscal year 1985.

3/ Preliminary.

4/ Includes Knutson-Vandenberg and salvage sale receipts. Does not include brush disposal and road costs.

5/ Included in volume harvested are adjustments for fiscal year 1983.

6/ MBF = thousand board feet.

7/ Columns may not add due to rounding.

Table 25—Values, costs, and associated outputs for the fiscal year 1985 timber sale program

	Units 2/	Regions 1/							Alaska 3/	Total 4/
		Northern	Rocky Mountain	South Western	Inter-Mountain	Pacific Southwest	Pacific Northwest	Southern	Eastern	
Value of products sold 5/	\$MM	24.0	4.7	8.5	5.8	88.7	333.7	76.9	19.2	563.2
Associated outputs and values 6/										
Wildlife and Fish	MMWFUD	0.7	0.6	0.3	0.2	2.7	2.5	0.6	0.4	8.3
	\$MM	15.1	6.8	6.4	4.7	14.9	59.6	12.5	8.2	133.9
Recreation	MMRVD	2.8	1.2	1.2	1.0	3.0	10.5	2.6	1.5	24.8
	\$MM	13.1	6.9	6.2	5.0	16.6	64.1	13.8	11.3	142.9
Range	MAUM	17.3	7.4	7.7	6.0	18.9	64.9	15.9	9.4	147.5
	\$MM	0.2	0.1	0.1	0.1	0.2	0.8	0.1	0.1	1.7
Free-use fuelwood	MMBF	60.0	45.0	135.0	50.0	22.0	76.0	125.0	50.0	569.0
	MUsers	15.0	17.0	48.0	16.0	100	24.0	53.0	15.0	200.0
	\$MM	0.1	0.3	0.6	0.3	0.2	0.3	0.7	0.1	2.7
Subtotal, associated values	(\$MM)	(28.5)	(14.1)	(13.3)	(10.1)	(31.9)	(124.8)	(27.1)	(19.7)	(281.2)
Costs of production 7/	\$MM	35.1	12.3	12.3	14.2	62.0	122.1	39.4	21.8	330.9
Net (value less cost)	\$MM	17.4	6.5	9.5	1.7	58.6	336.4	64.6	17.1	513.5
Roads 8/	\$MM	45.4	19.8	13.3	14.2	48.4	101.9	40.6	24.5	333.2

1/ Data are for National Forests and Grasslands only. Does not include Regional office or Washington office costs.

2/ \$MM = million dollars, MMWFUD = million wildlife/fish user days, MMRVD = million recreation visitor days, MAUM = thousand animal unit months, MMBF = million board feet, M Users = thousand users.

3/ Includes the timber sale program for the Tongass National Forest as directed by the Alaska National Interest Land Conservation Act, December 2, 1980.

4/ May not add due to rounding.

5/ This is the value of sawtimber, pulp, poles, and miscellaneous products such as posts, fuelwood, and Christmas trees. It does not include road values (purchaser credit or purchaser elected roads) or brush disposal, but does include K-V and salvage sale fund collections. The total value sold includes nonconvertible product value (approx. \$1.7 million) and the value of the long-term sale volume released (approx. \$3.3 million). These values are not included in Tables 23 and 24.

6/ These represent total quantities of selected outputs associated with the annual timber program, based on constant per-MMBF relationships in the 1985 RPA data base, current management alternative. These are the best estimates of field managers.

Values per unit output are based on those published in Table F.2, adjusted to 1985 dollars from the Draft Environmental Impact Statement for 1985 Resources Planning Act Program, except free-use fuelwood which is estimated annually by field managers.

7/ These are National Forest costs of producing sawtimber, pulp, poles, and miscellaneous products. This includes: timber management planning, silvicultural examination, sale preparation, harvest administration, salvage sale activities, resource support to timber, and K-V reforestation and TSI. Not included are general administration, timber management support to other resources, and road costs.

8/ Roads are considered capital assets that have a cost and a value. Included are Forest Service appropriated, purchaser credit, and purchaser elected road construction, and all engineering support expenditures.

NOTE: In response to recent Congressional direction relating to the economics of the National timber sale program, the Forest Service has been studying improved methods to account for the costs, revenues and other benefits of the timber sale program. A task force has investigated, formulated alternatives, tested and is now evaluating different techniques for timber sale accounting. It is expected that a preferred Forest Service alternative will be presented to Congress in 1986, with full implementation to take place in FY 1987.

**Table 26—Uncut timber volume under contract by Region—fiscal years 1981-85**

Region	1985	1984	1983	1982	1981
Million board feet <sup>1/</sup>					
Northern	3,812	3,986	3,845	3,634	3,325
Rocky Mountain	1,479	1,227	1,130	1,157	1,057
Southwestern	1,228	1,125	1,320	1,150	995
Intermountain	896	1,004	949	890	750
Pacific Southwest	7,261	6,975	7,278	6,563	5,884
Pacific Northwest	18,263	18,336	18,695	18,125	16,295
Southern	2,785	2,870	2,296	2,296	1,988
Eastern	2,034	1,909	1,802	1,917	1,937
Alaska	509	460	456	365	440
Total	38,267 <sup>2/</sup>	37,892	37,771	36,097	32,671

<sup>1/</sup> Volume in local scale. Long-term sales not included. Long-term sales volume under contract at the end of fiscal year 1984 was 7,112 million board feet, and 6,996 million board feet in 1985.

<sup>2/</sup> This volume under contract includes the 9,732 million board feet for which application for buyout has been received. Of this amount 6,599 million board feet of timber is in the Pacific Northwest Region.

Table 27—Timber funding--fiscal years 1983-85

	1985	1984	1983
	<u>1,000 dollars</u>		
National Forest System			
Timber management	140,432	141,912	129,334
Harvest administration	54,270	45,635	32,791
Timber support to other programs	-10,208	-8,354	-3,785
Subtotal	184,494	179,193	158,340
Support to timber sales program			
Mineral	1,195	939	1,189
Landline location	22,531	22,103	18,944
Forest fire protection	4,989	4,051	3,754
Road maintenance	35,710	31,933	39,447
Recreation	7,237	8,346	6,147
Wildlife and fish	8,187	8,410	6,954
Range	800	889	486
Soil and water	8,845	8,523	6,609
Subtotal	89,494	85,194	83,530
Road construction			
Forest Service construction	200,915	210,620	189,601
Purchaser construction	(192,301)	(240,000)	(240,000)
Purchaser construction by the Forest Service	33,903	50,475	44,900
Subtotal	234,818	261,095	234,501
Total, appropriated accounts	508,806	525,482	476,371
Special accounts			
Brush disposal	41,822	48,300	47,844
Timber salvage sales	16,055	12,775	14,106
Tongass timber supply fund	47,138	41,083	42,520
Subtotal	105,015	102,158	104,470
Total <u>1/</u>	613,821	627,640	580,841

1/ Includes Oregon and California (O&C) Grant Land Funding.

Table 28--Reforestation funding and accomplishments by funding source--fiscal years 1981-85

	Appropriated <u>1/</u>	Knutson-Vandenberg	Total
1981			
Million dollars <u>2/</u>	68.1	62.0	130.1
1,000 acres	217.9	204.8	422.7
Constant dollars/acre	312.5	302.7	307.8
1982			
Million dollars <u>2/</u>	63.1	67.9	131.0
1,000 acres	221.6	161.2	382.8
Constant dollars/acre	284.7	421.2	342.2
1983			
Million dollars <u>2/</u>	76.9 <u>3/</u>	68.8	145.7
1,000 acres	193.2 <u>3/</u>	168.5	361.7
Constant dollars/acre	398.0	408.3	402.8
1984			
Million dollars <u>2/</u>	44.4	68.9	113.3
1,000 acres	180.7 <u>4/</u>	195.3	376.0
Constant dollars/acre	245.7	352.8	301.3
1985			
Million dollars	57.4	70.8	128.2
1,000 acres	175.2	194.6	369.8
Constant dollars/acre	327.6	363.8	346.7

1/ Does not include funds for nursery and tree improvement.

2/ All dollars are constant 1985. Appropriated funding amounts in 1981 include general administration; other years do not.

3/ Does not include 65,500 acres of site preparation for planting in fiscal year 1984, as well as 14,500 acres of site preparation for natural regeneration accomplished with \$15 million of Federal Emergency Jobs Program funds, P.L. 98-8.

4/ Increased accomplishments and reduced costs were due to the 65,500 acres of advanced site preparation work as a result of the Federal Emergency Jobs Program in fiscal year 1983.

Table 29--Reforestation program needs--fiscal years 1985-87

	Backlog	Current or anticipated	Total	Annual program appropriated funds 1/	
	-----	1,000 acres-----		1,000 acres	Million dollars
10/1/84 balance	113	709	822		
Fiscal year 1985:					
New needs <u>2/</u>	0	+428	+428		
Adjustments <u>3/</u>	-56	+3	-53		
Accomplishments	-10	-360	-370	175.2	57.4
10/1/85 balance	47 <u>4/</u>	780	827		
Fiscal year 1986:					
New needs	0	+450	+450		
Adjustments	-47 <u>4/</u>	+47 <u>4/</u>	0		
Projected accomplishments	0	-346	-346	144.9	53.9
10/1/86 balance	0	931	931		
Fiscal year 1987:					
New needs	0	+450	+450		
Projected accomplishments	0	-334	-334	78.6	28.9
10/1/87 balance	0	1,047	1,047		

1/ Includes Reforestation Trust Fund pursuant to P.L. 96-451, as amended.

2/ New needs are the results of timber harvests, unsuccessful regeneration, and natural disasters such as fires, storms, insects, and diseases.

3/ The adjustments include acres regenerated through natural stocking and changes by management decision (land classification, multiple use, wilderness designation, and other land use decisions).

4/ These 47,000 acres have not yet gone through the Forest planning process, but are currently not feasible to plant or are within designated RARE II areas. They will be included in current needs and treated, when feasible technology, access, or proper seed supplies become available, or removed from the reforestation needs as land use decisions are finalized.

**Table 30—Reforestation needs as of October 1, 1985, by State, Forest, and site productivity class**

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	20-49	50-84	85-119	120+	
Alabama					
Alabama	0	1,451	3,385	537	5,373
Alaska					
Chugach	18	7	0	0	25
Tongass-Chatham	0	1,413	1,682	278	3,373
Tongass-Ketchikan	0	0	0	10,147	10,147
Tongass-Stikine	0	0	755	3,404	4,159
Subtotal	18	1,420	2,437	13,829	17,704
Arizona					
Apache-Sitgreaves	0	1,958	20	0	1,978
Coconino	108	4,750	0	0	4,858
Kaibab	363	1,853	0	0	2,216
Prescott	0	70	0	0	70
Tonto	67	1,272	0	0	1,339
Subtotal	538	9,903	20	0	10,461
Arkansas					
Ouachita	80	26,062	2,111	0	28,253
Ozark and St. Francis	0	5,055	1,264	0	6,319
Subtotal	80	31,117	3,375	0	34,572
California					
Angeles	0	356	0	0	356
Cleveland	499	35	0	0	534
Eldorado	264	817	1,299	1,062	3,442
Inyo	110	504	0	0	614
Klamath	3,458	5,765	7,946	2,419	19,588
Lassen	0	826	1,658	1,000	3,484
Los Padres	60	381	75	4	520
Mendocino	100	1,178	1,689	288	3,255
Modoc	0	1,932	1,065	0	2,997
Plumas	0	3,100	1,180	1,149	5,429
Rogue River	0	36	312	0	348
San Bernardino	135	316	50	0	501
Sequoia	314	3,776	2,007	429	6,526
Shasta-Trinity	0	6,549	8,784	4,600	19,933

See footnotes at end of table.

**Table 30—Reforestation needs as of October 1, 1985, by State, Forest,  
and site productivity class—Continued**

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	20-49	50-84	85-119	120+	
Sierra	122	2,477	2,507	855	5,961
Siskiyou	0	0	169	0	169
Six Rivers	0	0	2,547	1,770	4,317
Stanislaus	0	1,350	4,559	1,236	7,145
Tahoe	1,541	4,419	1,716	3,091	10,767
Toiyabe	350	1,101	150	0	1,601
Subtotal	6,953	34,918	37,713	17,903	97,487
Colorado					
Arapaho and Roosevelt	0	1,439	0	0	1,439
Grand Mesa, Uncompahgre, and Gunnison	1,313	1,951	488	0	3,752
Pike and San Isabel	1,112	741	0	0	1,853
Rio Grande	0	200	0	0	200
Routt	137	297	38	0	472
San Juan	10,785	6,068	0	0	16,853
White River	310	1,038	65	0	1,413
Subtotal	13,657	11,734	591	0	25,982
Florida					
Florida	17,298	10,111	5,338	397	33,144
Georgia					
Chattahoochee and Oconee	0	1,962	4,279	1,194	7,435
Idaho					
Boise	5,750	4,774	2,709	1,537	14,770
Caribou	0	1,206	121	0	1,327
Challis	303	144	0	0	447
Clearwater	6,615	239	3,633	14,434	24,921
Idaho Panhandle	11,390	919	8,587	7,962	28,858
Kootenai	0	0	634	353	987
Lolo	12	0	0	0	12
Nezperce	7,765	1,429	3,241	4,162	16,597
Payette	140	1,843	2,951	0	4,934
Salmon	3,580	1,411	0	0	4,991
Sawtooth	1,638	0	0	0	1,638
Targhee	0	4,083	0	0	4,083
Subtotal	37,193	16,048	21,876	28,448	103,565

See footnotes at end of table.

**Table 30—Reforestation needs as of October 1, 1985, by State, Forest, and site productivity class—Continued**

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	20-49	50-84	85-119	120+	
Illinois Shawnee	200	3,011	327	0	3,538
Indiana Hoosier	0	828	486	0	1,314
Kentucky Daniel Boone	263	2,464	1,639	147	4,513
Louisiana Kisatchie	0	2,108	6,004	12,269	20,381
Maine White Mountain	160	350	115	10	635
Michigan Hiawatha	1,806	2,258	316	135	4,515
Huron-Manistee	3,008	4,362	150	0	7,520
Ottawa	0	2,580	865	0	3,445
Subtotal	4,814	9,200	1,331	135	15,480
Minnesota Chippewa	840	554	0	0	1,394
Superior	830	5,730	829	151	7,540
Subtotal	1,670	6,284	829	151	8,934
Mississippi Mississippi	241	1,623	10,397	6,861	19,122
Missouri Mark Twain	5,790	7,669	88	12	13,559
Montana Beaverhead	549	1,140	163	0	1,852
Bitterroot	3,197	2,300	1,516	254	7,267
Custer	285	335	81	0	701
Deerlodge	1,322	240	16	0	1,578
Flathead	9,374	1,509	5,421	1,021	17,325
Gallatin	2,998	3,148	235	16	6,397
Helena	1,957	637	246	0	2,840
Idaho Panhandle	11	0	0	0	11
Kootenai	5,393	5,454	20,096	3,386	34,329
Lewis and Clark	586	926	296	0	1,808
Lolo	2,213	4,353	3,287	630	10,483
Subtotal	27,885	20,042	31,357	5,307	84,591

See footnotes at end of table.

**Table 30—Reforestation needs as of October 1, 1985, by State, Forest, and site productivity class—Continued**

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	20-49	50-84	85-119	120+	
New Hampshire White Mountain	320	700	230	37	1,287
New Mexico					
Carson	2,401	7,750	0	0	10,151
Cibola	2,064	3,995	0	0	6,059
Gila	57	866	1,226	0	2,149
Lincoln	0	347	0	0	347
Santa Fe	0	207	0	0	207
Subtotal	4,522	13,165	1,226	0	18,913
New York Green Mountain	0	20	60	80	160
North Carolina North Carolina	285	3,916	2,224	2,978	9,403
Ohio Wayne	1,366	253	68	0	1,687
Oklahoma Ouachita	0	1,689	200	541	2,430
Oregon					
Deschutes	1,446	11,669	3,224	858	17,197
Fremont	4,294	2,931	801	36	8,062
Malheur	1,624	4,003	0	0	5,627
Mt. Hood	358	11,543	9,935	1,819	23,655
Ochoco	2,318	2,932	0	0	5,250
Rogue River	0	528	11,054	250	11,832
Siskiyou	4	280	4,103	1,438	5,825
Siuslaw	0	0	0	6,352	6,352
Umatilla	1,323	4,830	38	0	6,191
Umpqua	0	289	6,488	796	7,573
Wallowa-Whitman	2,231	8,410	2,604	0	13,245
Willamette	0	387	8,842	11,192	20,421
Winema	3,517	615	739	2,026	6,897
Subtotal	17,115	48,417	47,828	24,767	138,127
Pennsylvania Allegheny	0	3,640	4,280	0	7,920

See footnotes at end of table.

**Table 30—Reforestation needs as of October 1, 1985, by State, Forest, and site productivity class—Continued**

State, Commonwealth, or Territory 1/ National Forest	Acres by site productivity class 2/				Total acres
	20-49	50-84	85-119	120+	
Puerto Rico Caribbean	0	0	564	0	564
South Carolina South Carolina	0	623	2,740	2,865	6,228
South Dakota Black Hills	2,437	0	0	0	2,437
Tennessee Cherokee	0	449	842	213	1,504
Texas Texas	0	1,345	20,706	4,841	26,892
Utah					
Ashley	6,898	2,922	0	0	9,820
Dixie	649	1,007	0	0	1,656
Fishlake	0	143	120	0	263
Manti-LaSal	0	506	0	0	506
Uinta	0	0	157	0	157
Wasatch	640	106	0	0	746
Subtotal	8,187	4,684	277	0	13,148
Vermont Green Mountain	300	865	589	0	1,754
Virginia					
George Washington	920	527	399	803	2,649
Jefferson	925	2,361	95	283	3,664
Subtotal	1,845	2,888	494	1,086	6,313
Washington					
Colville	109	4,389	2,017	9	6,524
Gifford Pinchot	16	5,468	5,040	2,541	13,065
Idaho Panhandle	45	11	803	232	1,091
Mt. Baker-Snoqualmie	0	465	5,142	2,313	7,920
Okanogan	993	1,719	0	0	2,712
Olympic	0	921	8,324	2,643	11,888
Umatilla	0	460	110	0	570
Wenatchee	1,077	5,181	3,760	926	10,944
Subtotal	2,240	18,614	25,196	8,664	54,714

See footnotes at end of table.

**Table 30—Reforestation needs as of October 1, 1985, by State, Forest, and site productivity class—Continued**

State, Commonwealth, or Territory <sup>1/</sup> National Forest	Acres by site productivity class <sup>2/</sup>				Total acres
	20-49	50-84	85-119	120+	
West Virginia					
George Washington	70	0	25	0	95
Monongahela	0	95	831	262	1,188
Subtotal	70	95	856	262	1,283
Wisconsin					
Chequamegon	128	4,379	135	57	4,699
Nicolet	357	2,322	572	321	3,572
Subtotal	485	6,701	707	378	8,271
Wyoming					
Bighorn	2,060	437	0	0	2,497
Black Hills	94	0	0	0	94
Bridger-Teton	307	2,844	672	0	3,823
Medicine Bow	6,637	2,800	0	0	9,437
Shoshone	187	0	0	0	187
Targhee	0	246	0	0	246
Subtotal	9,285	6,327	672	0	16,284
Total	165,217	286,634	241,346	133,912	827,109

<sup>1/</sup> States not listed had no reforestation needs as of October 1, 1985.

<sup>2/</sup> Site productivity class refers to the amount of wood produced in cubic feet per acre per year in a natural unmanaged stand.

**Table 31—Timber stand improvement funding and accomplishments by funding source—  
fiscal years 1981-85**

	Appropriated <u>1/</u>	Knutson-Vandenberg	Total
1981			
Million dollars <u>2/</u>	37.8	24.1	61.9
1,000 acres	257.0	139.4	396.4
Constant dollars/acre	147.1	172.9	156.2
1982			
Million dollars <u>2/</u>	24.4	16.1	40.5
1,000 acres	240.2	120.8	361.0
Constant dollars/acre	101.6	133.3	112.2
1983			
Million dollars <u>2/</u>	35.1 <u>3/</u>	21.1	56.2
1,000 acres	270.6 <u>3/</u>	127.0	397.6
Constant dollars/acre	129.7	166.1	141.3
1984			
Million dollars <u>2/</u>	26.1	21.9	48.0
1,000 acres	250.1	111.5	361.6
Constant dollars/acre	104.4	196.4	132.7
1985			
Million dollars <u>2/</u>	33.6	19.3	52.9
1,000 acres	300.5	120.9	421.4
Constant dollars/acre	111.8	159.6	125.5

1/ All dollars are constant 1985. Appropriated funding amounts in 1981 include general administration; other years do not.

2/ Does not include funds for nursery and tree improvement.

3/ Does not include 158,000 acres of timber stand improvement accomplished with \$20 million of Federal Emergency Jobs Program funding, P.L. 98-8.

*Table 32—Timber stand improvement program needs—fiscal years 1985-87*

	Work needs 1,000 acres	Annual program, appropriated funds 1/ 1,000      Million acres      dollars	
10/1/84 balance	1,547		
Fiscal year 1985:			
New needs	326		
Accomplishments	-421	300.5	33.6
10/1/85 balance	1,452		
Fiscal year 1986:			
New needs	+400		
Projected accomplishments	-334	197	30.3
10/1/86 balance	1,518		
Fiscal year 1987:			
New needs	400		
Projected accomplishments	303	121	15.9
10/1/87 balance	1,615 <u>2/</u>		

1/ Includes Reforestation Trust Fund pursuant to P.L. 96-451,  
as amended, through fiscal year 1985.

2/ This represents over four years of future accomplishments.

Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class

State, Commonwealth, or Territory 1/ National Forest	Cubic foot productivity classes 2/ 20-49 50-84 85-119 120+				Total TSI 3/	Release subtotal	Thinning subtotal	Ferti- zation	
								subtotal	subtotal
Alabama									
Alabama	0	1,747	1,302	127	3,176	3,176	0	0	0
Alaska									
Chugach	286	28	658	0	972	686	286	0	0
Tongass-Chatham	0	40	3,903	235	4,178	1,935	2,243	0	0
Tongass-Ketchikan	0	0	0	31,388	31,388	1,618	29,770	0	0
Tongass-Stikine	0	0	4,243	14,097	18,340	0	18,340	0	0
Subtotal	286	68	8,804	45,720	54,878	4,239	50,639	0	0
Arizona									
Apache-Sitgreaves	17,687	21,036	500	0	39,223	0	39,223	0	0
Coconino	0	31,731	0	0	31,731	0	31,731	0	0
Kaibab	1,244	17,293	0	0	18,537	233	18,304	0	0
Tonto	2,874	5,863	0	0	8,737	0	8,737	0	0
Subtotal	21,805	75,923	500	0	98,228	233	97,995	0	0
Arkansas									
Ouachita	136	28,199	6,469	72	34,876	28,538	6,338	0	0
Ozark and St. Francis	0	5,765	1,442	0	7,207	5,058	2,149	0	0
Subtotal	136	33,964	7,911	72	42,083	33,596	8,487	0	0
California									
Angeles	0	1,063	0	0	1,063	591	447	25	0
Cleveland	784	2,272	0	0	3,056	325	2,731	0	0
Eldorado	100	525	2,634	1,866	5,125	4,414	711	0	0
Inyo	0	2,745	0	0	2,745	70	2,675	0	0
Klamath	3,674	20,967	18,309	7,842	50,792	29,002	21,790	0	0
Lassen	0	2,397	3,595	950	6,942	2,910	4,032	0	0
Los Padres	913	360	85	30	1,388	511	877	0	0
Mendocino	258	3,817	4,444	210	8,729	6,722	1,867	140	0
Modoc	1,010	12,874	8,483	1,000	23,367	13,953	8,221	1,193	0
Plumas	1,964	18,089	10,184	4,987	35,224	21,162	13,007	1,055	0

See footnotes at end of table.

Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class—Continued

State, Commonwealth, or Territory 1/ National Forest	Cubic foot productivity classes 2/ 20-49 50-84 85-119 120+					Total TSI 3/	Release subtotal	Thinning subtotal	Fertili- zation subtotal	Pruning subtotal
	20-49	50-84	85-119	120+						
Rogue River	0	50	146	0	196	196	196	0	0	0
San Bernardino	1,149	3,252	413	0	4,814	4,814	1,338	3,476	0	0
Sequoia	18	2,452	2,792	994	6,256	6,256	3,973	1,611	672	0
Shasta-Trinity	0	8,439	15,611	7,839	31,889	31,889	28,311	3,447	131	0
Sierra	438	3,962	3,986	2,386	10,772	10,772	5,412	5,360	0	0
Siskiyou	0	0	485	0	485	485	449	36	0	0
Six Rivers	0	638	24,836	18,850	44,324	44,324	37,629	6,545	150	0
Stanislaus	0	1,184	7,267	2,354	10,805	10,805	9,253	1,552	0	0
Tahoe	7,552	7,148	4,668	14,546	33,914	33,914	24,150	9,764	0	0
Toiyabe	4,283	3,803	0	0	8,086	8,086	2,462	5,624	0	0
Subtotal	22,143	96,037	107,938	63,854	289,972	289,972	192,833	93,773	3,366	0
Colorado										
Arapaho and Roosevelt	69,000	25,420	0	0	94,420	94,420	9,051	85,369	0	0
Grand Mesa, Uncompahgre, and Gunnison	2,022	6,624	2,675	0	11,321	11,321	9,186	2,135	0	0
Manti-LaSal	0	370	0	0	370	370	0	370	0	0
Pike and San Isabel	1,211	808	0	0	2,019	2,019	1,214	805	0	0
Rio Grande	3,210	20,837	3,497	0	27,544	27,544	16,154	11,390	0	0
Routt	395	3,187	0	0	3,582	3,582	3,104	478	0	0
San Juan	0	10,086	0	0	10,086	10,086	9,921	165	0	0
White River	815	2,443	815	0	4,073	4,073	3,398	675	0	0
Subtotal	76,653	69,775	6,987	0	153,415	153,415	52,028	101,387	0	0
Florida										
Florida	43	4,567	1,534	154	6,298	6,298	392	0	5,906	0
Georgia										
Chattahoochee and Oconee	0	2,697	3,485	1,458	7,640	7,640	6,817	823	0	0
Idaho										
Boise	430	14,380	386	653	15,849	15,849	4,083	11,766	0	0
Caribou	0	1,878	132	0	2,010	2,010	1,440	570	0	0
Challis	844	550	0	0	1,394	1,394	385	1,009	0	0
Clearwater	2,018	10	2,094	7,652	11,774	11,774	1,947	9,827	0	0

See footnotes at end of table.

**Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class—Continued**

State, Commonwealth, or Territory 1/ National Forest	Cubic foot productivity classes 2/ 20-49 50-84 85-119 120+					Total TSI 3/	Release subtotal	Thinning subtotal	Fertili- zation subtotal	Pruning subtotal
	20-49	50-84	85-119	120+						
Idaho Panhandle	7,204	2,414	17,102	18,405	45,125	11,971	33,154	0	0	0
Kootenai	23	0	422	435	880	490	390	0	0	0
Nezperce	2,452	449	1,703	329	4,933	1,310	3,623	0	0	0
Payette	258	2,059	3,772	0	6,089	1,285	4,804	0	0	0
Salmon	1,088	447	0	0	1,535	232	1,303	0	0	0
Sawtooth	412	0	0	0	412	237	175	0	0	0
Targhee	0	460	0	0	460	135	325	0	0	0
Subtotal	14,729	22,647	25,611	27,474	90,461	23,515	66,946	0	0	0
Illinois Shawnee	142	4,172	390	68	4,772	3,142	1,544	0	86	
Indiana Hoosier	0	4,893	3,468	0	8,361	3,211	2,941	0	2,209	
Kentucky Daniel Boone	171	4,758	3,933	841	9,703	5,483	4,152	3	65	
Louisiana Kitsatchie	0	955	1,324	2,510	4,789	4,287	502	0	0	
Maine White Mountain	55	145	45	19	264	185	79	0	0	
Michigan Hiawatha	488	6,440	2,301	0	9,229	2,366	863	0	6,000	
Huron-Manistee	731	1,804	266	0	2,801	2,135	666	0	0	
Ottawa	0	890	292	0	1,182	1,182	0	0	0	
Subtotal	1,219	9,134	2,859	0	13,212	5,683	1,529	0	6,000	
Minnesota Chippewa	1,948	1,598	0	0	3,546	3,246	0	0	300	
Superior	688	4,753	757	126	6,324	5,704	550	0	70	
Subtotal	2,636	6,351	757	126	9,870	8,950	550	0	370	

See footnotes at end of table.

Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class—Continued

State, Commonwealth, or Territory 1/ National Forest	Cubic foot productivity classes 2/ 20-49 50-84 85-119 120+				Total TSI 3/	Release subtotal	Thinning subtotal	Ferti- li- zation subtotal	Pruning subtotal
	20-49	50-84	85-119	120+					
Mississippi									
Mississippi	165	171	1,274	1,582	3,192	2,082	774	336	0
Missouri									
Mark Twain	0	9,031	91	0	9,122	4,514	4,474	0	134
Montana									
Beaverhead	895	855	295	0	2,045	691	1,354	0	0
Bitterroot	2,670	1,145	1,646	95	5,556	597	4,959	0	0
Custer	963	215	0	0	1,178	281	897	0	0
Deerlodge	2,582	953	206	0	3,741	503	3,238	0	0
Flathead	2,000	1,304	8,404	2,004	13,712	1,198	12,514	0	0
Gallatin	229	2,272	220	113	2,834	248	2,586	0	0
Helena	668	1,224	1,085	111	3,088	948	2,140	0	0
Idaho Panhandle	88	28	211	40	367	63	304	0	0
Kootenai	3,521	4,750	20,219	8,325	36,815	1,417	35,398	0	0
Lewis and Clark	1,168	325	350	0	1,843	585	1,258	0	0
Lolo	2,543	3,545	4,364	417	10,869	695	10,174	0	0
Subtotal	17,327	16,616	37,000	11,105	82,048	7,226	74,822	0	0
New Hampshire									
White Mountain	330	740	245	32	1,347	967	380	0	0
New Mexico									
Carson	10,062	12,635	300	0	22,997	727	22,270	0	0
Cibola	0	13,328	0	0	13,328	0	13,328	0	0
Gila	8,609	53,585	4,632	480	67,306	800	66,506	0	0
Lincoln	225	1,843	0	0	2,068	225	1,843	0	0
Santa Fe	0	23,528	0	0	23,528	0	23,528	0	0
Subtotal	18,896	104,919	4,932	480	129,227	1,752	127,475	0	0
New York									
Green Mountain	41	367	167	0	575	93	482	0	0

See footnotes at end of table.

**Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class—Continued**

State, Commonwealth, or Territory 1/ National Forest	Cubic foot productivity classes 2/ 20-49 50-84 85-119 120+				Total TSI 3/	Release subtotal	Thinning subtotal	Fertili- zation	
								subtotal	Pruning subtotal
North Carolina North Carolina	75	1,695	1,304	2,486	5,560	3,134	2,152	274	0
Ohio Wayne	0	2,747	2,186	0	4,933	1,014	2,506	0	1,413
Oklahoma Ouachita	26	2,640	355	315	3,336	1,921	1,415	0	0
Oregon Deschutes	2,925	8,620	4,920	0	16,465	4,953	11,512	0	0
Fremont	8,390	1,696	2,469	0	12,555	1,826	10,705	24	0
Malheur	8,931	12,879	28	0	21,838	146	21,692	0	0
Mt. Hood	0	3,043	6,333	1,271	10,647	531	8,116	2,000	0
Ochoco	9,887	2,291	16	0	12,194	918	11,276	0	0
Rogue River	0	2,531	13,600	481	16,612	13,823	1,544	1,245	0
Siskiyou	138	4,530	21,341	6,532	32,541	25,442	7,099	0	0
Siuslaw	0	0	0	8,724	8,724	4,001	4,723	0	0
Umatilla	3,551	593	0	0	4,144	82	4,062	0	0
Umpqua	25	4,502	13,855	7,184	25,566	5,846	9,379	10,341	0
Wallowa-Whitman	1,050	7,208	2,344	21	10,623	1,266	9,357	0	0
Willamette	0	585	7,541	26,131	34,257	5,492	12,009	16,756	0
Winema	7,617	1,144	382	0	9,143	292	8,851	0	0
Subtotal	42,514	49,622	72,829	50,344	215,309	64,618	120,325	30,366	0
Pennsylvania Allegheny	0	789	1,000	0	1,789	0	1,789	0	0
Puerto Rico Caribbean	0	0	1,513	0	1,513	1,513	0	0	0
South Carolina South Carolina	0	253	1,296	1,848	3,397	2,485	912	0	0
South Dakota Black Hills	13,790	0	0	0	13,790	0	13,790	0	0
Tennessee Cherokee	53	2,228	1,094	1,259	4,634	2,468	2,166	0	0

See footnotes at end of table.

Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class—Continued

State, Commonwealth, or Territory 1/ National Forest	Cubic foot productivity classes 2/ 20-49 50-84 85-119 120+				Total TSI 3/	Release subtotal	Thinning subtotal	Ferti- li- zation subtotal	Pruning subtotal
	20-49	50-84	85-119	120+					
Texas									
Texas	0	158	1,903	771	2,832	1,503	1,255	74	0
Utah									
Ashley	3,818	711	0	0	4,529	346	4,183	0	0
Dixie	1,219	6,512	685	0	8,416	1,044	7,372	0	0
Fishlake	0	120	60	0	180	0	180	0	0
Manti-LaSal	0	1,191	0	0	1,191	0	1,191	0	0
Uinta	0	0	111	0	111	0	111	0	0
Wasatch	61	119	272	0	452	0	452	0	0
Subtotal	5,098	8,653	1,128	0	14,879	1,390	13,489	0	0
Vermont									
Green Mountain	1,053	2,493	147	0	3,693	2,215	1,478	0	0
Virginia									
George Washington	110	108	227	378	823	613	210	0	0
Jefferson	203	2,035	199	927	3,364	1,723	1,641	0	0
Subtotal	313	2,143	426	1,305	4,187	2,336	1,851	0	0
Washington									
Colville	572	4,113	4,181	49	8,915	2,755	6,160	0	0
Gifford Pinchot	110	9,045	15,283	7,964	32,402	163	24,145	8,094	0
Idaho Panhandle	16	30	944	565	1,555	234	1,321	0	0
Mt. Baker-Snoqualmie	0	2,204	8,114	2,455	12,773	350	9,066	3,357	0
Okanogan	525	2,312	0	0	2,837	0	2,837	0	0
Olympic	81	1,252	6,587	2,197	10,117	538	5,781	3,798	0
Umatilla	35	2,062	170	0	2,267	0	2,267	0	0
Wenatchee	1,618	20,556	3,561	397	26,132	5,693	20,439	0	0
Subtotal	2,957	41,574	38,840	13,627	96,998	9,733	72,016	15,249	0

See footnotes at end of table.

Table 33—Timber stand improvement needs as of October 1, 1985, by State, Forest, and cubic foot productivity class—Continued

State, Commonwealth, or Territory 1/	Cubic foot productivity classes 2/				Total TSI 3/	Release subtotal	Thinning subtotal	Ferti- lization subtotal	Pruning subtotal
	20-49	50-84	85-119	120+					
National Forest									
West Virginia									
George Washington	0	0	165	107	272	272	0	0	0
Monongahela	0	66	573	180	819	624	195	0	0
Subtotal	0	66	738	287	1,091	896	195	0	0
Wisconsin									
Chequamegon	32	1,116	0	13	1,161	1,133	28	0	0
Nicolet	0	1,532	998	200	2,730	1,215	275	0	1,240
Subtotal	32	2,648	998	213	3,891	2,348	303	0	1,240
Wyoming									
Bighorn	30,143	1,082	0	0	31,225	27,107	4,118	0	0
Black Hills	1,460	0	0	0	1,460	0	1,460	0	0
Bridger-Teton	300	165	1,039	0	1,504	0	1,504	0	0
Medicine Bow	900	3,966	0	0	4,866	1,165	3,701	0	0
Shoshone	6,340	1,640	0	0	7,980	0	7,980	0	0
Subtotal	39,143	6,853	1,039	0	47,035	28,272	18,763	0	0
Total	281,831	594,239	347,353	228,077	1,451,500	490,250	894,159	55,574	11,517

1/ States not listed had no timber stand improvement needs as of October 1, 1984.

2/ Cubic foot productivity class refers to the cubic feet of wood produced per acre per year in a natural unmanaged stand.

3/ TSI = timber stand improvement

Table 34—Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest—  
fiscal year 1985

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Timber Stand Improvement					
	Artificial Regeneration		Natural Regeneration		Total	Release	Thinning	Fertili- zation	Pruning	Total
	Planted	Seeded	w/ site prep. 2/	w/o site prep. 2/						
Alabama										
Alabama	4,062	638	3,703	0	8,403	6,508	0	0	0	6,508
Alaska										
Tongass-Ketchikan	0	0	0	4,932	4,932	0	74	0	0	74
Tongass-Stikine	353	0	0	5,459	5,812	0	1,869	0	0	1,869
Subtotal	353	0	0	10,391	10,744	0	1,943	0	0	1,943
Arizona										
Apache-Sitgreaves	384	0	0	0	384	0	8,748	0	0	8,748
Coconino	567	0	0	544	1,111	0	13,128	0	0	13,128
Coronado	0	0	0	0	0	0	65	0	0	65
Kaibab	3,213	0	0	284	3,497	875	4,591	0	0	5,466
Prescott	80	0	0	0	80	38	156	0	0	194
Tonto	19	0	0	0	19	200	1,303	0	0	1,503
Subtotal	4,263	0	0	828	5,091	1,113	27,991	0	0	29,104
Arkansas										
Ouachita	7,842	1,240	125	0	9,207	12,964	814	0	0	13,778
Ozark and St. Francis	3,651	0	2,802	0	6,453	6,338	3,738	0	0	10,076
Subtotal	11,493	1,240	2,927	0	15,660	19,302	4,552	0	0	23,854
California										
Angeles	183	0	0	0	183	92	0	0	0	92
Eldorado	16	0	0	0	16	371	0	0	0	371
Inyo	290	0	0	0	290	0	350	0	0	350
Klamath	944	0	0	166	1,110	1,131	1,167	0	0	2,298
Lassen	832	0	0	0	832	0	523	0	0	523
Los Padres	5	0	0	0	5	0	0	0	0	0
Mendocino	647	0	0	0	647	0	0	0	0	0
Modoc	2,362	0	0	0	2,362	0	0	0	0	0

See footnotes at end of table.

**Table 34—Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest—  
fiscal year 1985**

State, Commonwealth, or Territory 1/ National Forest	Reforestation			Timber Stand Improvement				
	Artificial Regeneration Planted	Seeded	Natural Regeneration w/ site prep. 2/ w/o site prep. 2/	Total	Release	Thinning	Fertili- zation	Pruning
Plumas	514	0	0	514	0	71	0	0
San Bernardino	324	0	0	324	49	255	0	0
Shasta-Trinity	3,660	0	0	3,660	594	769	0	0
Sierra	1,143	0	0	1,143	260	0	0	0
Siskiyou	557	0	0	557	52	71	0	0
Six Rivers	1,365	0	0	1,365	6	1,936	0	0
Stanislaus	523	0	0	523	591	84	0	0
Tahoe	43	0	0	43	106	0	0	0
Toiyabe	0	0	0	0	0	350	0	0
Subtotal	13,408	0	0	13,574	3,252	5,576	0	0
Colorado	0	0	0	0	0	33	0	0
Arapaho and Roosevelt Grand Mesa, Uncompahgre, and Gunnison	425	0	460	885	854	3,809	0	0
Manti-LaSal	0	0	0	0	0	230	0	0
Pike and San Isabel	322	0	1	506	0	0	0	0
Rio Grande	0	0	0	0	0	847	0	0
Routt	464	164	452	1,080	959	204	0	0
San Juan	3,525	0	45	9,949	0	175	0	0
White River	244	0	0	244	395	116	0	0
Subtotal	4,980	164	958	12,664	2,208	5,414	0	0
Florida	5,863	5,780	0	11,643	1,074	0	3,022	0
Georgia	5,377	0	1,164	6,541	6,735	0	0	0
Chattahoochee and Oconee								
Idaho	64	0	0	64	336	4,397	0	0
Boise	19	0	0	19	0	0	0	0
Challis	1,307	0	89	1,586	401	546	0	0
Clearwater	3,801	0	477	4,989	2,603	5,234	0	0
Idaho Panhandle								

See footnotes at end of table.

Table 34—Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest—  
fiscal year 1985

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Timber Stand Improvement					
	Artificial Regeneration		Natural Regeneration		Total	Release	Thinning	Fertili- zation	Pruning	Total
	Planted	Seeded	w/ site prep. 2/	w/o site prep. 2/						
Nezperce	989	0	480	631	2,100	664	374	0	0	1,038
Payette	1,348	0	0	0	1,348	0	0	0	0	0
Salmon	489	0	129	298	916	0	111	0	0	111
Sawtooth	270	0	0	0	270	0	0	0	0	0
Targhee	0	0	0	0	0	653	48	0	0	701
Subtotal	8,287	0	1,175	1,830	11,292	4,657	10,710	0	0	15,367
Illinois Shawnee	653	0	268	22	943	163	18	0	0	181
Indiana Wayne-Hoosier	0	0	0	0	0	74	0	0	0	74
Kentucky Daniel Boone	1,802	0	4,570	0	6,372	4,061	293	0	10	4,364
Louisiana Kisatchie	3,722	0	806	0	4,528	546	219	0	0	765
Maine White Mountain	0	0	82	18	100	126	0	0	0	126
Michigan Hiawatha	806	140	1,194	38	2,178	589	233	0	0	822
Huron-Manistee	1,895	226	4,343	1,719	8,183	1,839	689	0	0	2,528
Ottawa	934	0	2,492	2,030	5,456	1,190	748	0	0	1,938
Subtotal	3,635	366	8,029	3,787	15,817	3,618	1,670	0	0	5,288
Minnesota Chippewa	1,996	22	1,405	125	3,548	2,308	0	0	0	2,308
Superior	6,648	356	547	651	8,202	4,766	1,123	0	0	5,889
Subtotal	8,644	378	1,952	776	11,750	7,074	1,123	0	0	8,197

See footnotes at end of table.

**Table 34—Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest—  
fiscal year 1985**

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Timber Stand Improvement					
	Artificial Regeneration		Natural Regeneration		Total	Release	Thinning	Fertili- zation	Pruning	Total
	Planted	Seeded	w/ site prep. 2/	w/o site prep. 2/						
Mississippi Mississippi	9,337	102	1,033	0	10,472	6,146	1,358	513	0	8,017
Missouri Mark Twain	1,197	566	4,934	4	6,701	4,945	2,981	0	0	7,926
Montana										
Beaverhead	882	0	901	743	2,526	0	192	0	0	192
Bitterroot	2,838	0	0	3	2,841	515	1,582	0	0	2,097
Custer	0	0	0	0	0	90	163	0	0	253
Deerlodge	103	0	441	811	1,355	231	302	0	0	533
Flathead	3,469	164	375	509	4,517	110	1,700	0	0	1,810
Gallatin	769	83	564	75	1,491	0	471	0	0	471
Helena	124	0	0	0	124	0	274	0	0	274
Kootenai	8,255	0	2,500	3,719	14,474	15	3,993	0	0	4,008
Lewis and Clark	344	0	103	274	721	0	126	0	0	126
Lolo	1,577	0	639	627	2,843	94	1,103	0	0	1,197
Subtotal	18,361	247	5,523	6,761	30,892	1,055	9,906	0	0	10,961
Nevada Humboldt	0	0	0	0	0	25	0	0	0	25
New Hampshire White Mountain	0	0	139	69	208	663	0	0	0	663
New Mexico										
Carson	823	0	0	0	823	1,366	5,859	0	0	7,225
Cibola	130	0	0	0	130	0	2,980	0	0	2,980
Gila and Apache	638	0	0	0	638	320	4,515	0	0	4,835
Lincoln	72	0	0	0	72	0	614	0	0	614
Santa Fe	468	0	0	0	468	0	3,413	0	0	3,413
Subtotal	2,131	0	0	0	2,131	1,686	17,381	0	0	19,067
New York Green Mountain	0	0	44	0	44	0	64	0	0	64
North Carolina North Carolina	2,513	0	2,188	0	4,701	1,530	448	0	0	1,978

See footnotes at end of table.

Table 34—Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest—  
fiscal year 1985

State, Commonwealth, or Territory 1/ National Forest	Reforestation			Timber Stand Improvement			
	Artificial Regeneration Planted	Natural Regeneration		Release	Thinning	Fertili- zation	Pruning
		Seeded	w/ site prep. 2/				
			w/o site prep. 2/	Total			Total
Ohio							
Wayne	0	0	0	0	436	0	483
Oklahoma							
Ouachita	1,317	0	0	1,317	1,665	114	1,779
Oregon							
Deschutes	6,401	0	2,774	9,383	413	5,484	5,897
Fremont	2,876	0	0	2,918	404	8,187	9,729
Malheur	1,915	0	0	2,506	0	2,007	2,007
Mt. Hood	952	0	0	1,212	0	2,893	2,893
Ochoco	707	0	0	707	0	1,704	1,704
Rogue River	11,390	0	0	11,390	724	269	993
Siskiyou	3,098	0	18	3,467	1,886	1,354	3,332
Siuslaw	3,587	0	0	3,615	1,174	1,423	2,816
Umatilla	1,687	0	794	2,481	0	2,089	2,089
Umpqua	1,622	12	0	1,646	1,950	2,819	6,298
Wallowa-Whitman	2,342	0	434	2,896	250	3,175	3,425
Willamette	16,399	24	24	16,656	618	5,451	18,040
Winema	2,605	0	0	3,946	0	5,862	5,862
Subtotal	55,581	36	4,044	62,823	7,419	42,717	65,085
Pennsylvania							
Allegheny	0	0	741	45	0	1,807	1,807
Puerto Rico							
Caribbean	100	0	0	100	1,180	0	1,180
South Carolina							
South Carolina	3,559	0	1,150	4,781	1,900	856	3,865
South Dakota							
Black Hills	0	0	0	0	0	15,404	15,404
Tennessee							
Cherokee	2,597	0	601	3,198	3,099	0	3,099
Texas							
Texas	1,603	112	887	2,602	647	748	1,395

See footnotes at end of table.

**Table 34—Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest—  
fiscal year 1985**

State, Commonwealth, or Territory 1/ National Forest	Reforestation				Timber Stand Improvement				
	Artificial Regeneration		Natural Regeneration		Release	Thinning	Fertili- zation	Pruning	Total
	Planted	Seeded	w/ site prep. 2/	w/o site prep. 2/					
Utah									
Ashley	64	0	348	0	412	539	0	0	1,089
Dixie	130	0	0	0	130	4,039	0	0	4,039
Fishlake	0	0	0	0	0	150	0	0	150
Manti-LaSal	116	0	0	0	116	526	0	0	526
Uinta	0	0	0	76	76	6	0	0	6
Wasatch	81	0	0	0	81	917	0	0	917
Subtotal	391	0	348	76	815	6,177	0	0	6,727
Vermont									
Green Mountain	98	0	373	29	500	126	0	0	315
Virginia									
George Washington	477	0	2,236	0	2,713	325	0	0	799
Jefferson	706	0	1,961	0	2,667	1,166	0	0	1,926
Subtotal	1,183	0	4,197	0	5,380	1,085	0	0	2,725
Washington									
Colville	1,583	51	102	0	1,736	972	0	0	972
Gifford Pinchot	15,004	0	49	98	15,151	285	4,058	0	11,895
Idaho Panhandle	690	0	11	93	794	0	0	0	282
Mt. Baker-Snoqualmie	4,362	0	25	191	4,578	0	0	0	0
Okanogan	0	0	261	0	261	0	0	0	429
Olympic	5,902	0	0	0	5,902	525	1,963	0	4,955
Umatilla	404	0	22	64	490	0	0	0	0
Wenatchee	72	0	12	10	94	0	0	0	0
Subtotal	28,017	51	482	456	29,006	810	11,702	6,021	18,533
West Virginia									
George Washington	34	0	155	0	189	150	0	0	316
Monongahela	0	0	192	0	192	1,166	0	0	1,434
Subtotal	34	0	347	0	381	1,316	434	0	1,750

See footnotes at end of table.

Table 34--Reforestation and timber stand improvement acreages certified as satisfactorily stocked, by State and National Forest--  
fiscal year 1985

State, Commonwealth, or Territory 1/ National Forest	Reforestation			Timber Stand Improvement						
	Artificial Planted	Regeneration Seeded	Natural w/ site prep. 2/	Regeneration w/o site prep. 2/	Total	Release	Thinning	Fertili- zation	Pruning	Total
Wisconsin										
Chequamegon	256	0	2,103	0	2,359	790	188	0	0	978
Nicolet	1,800	0	2,353	87	4,240	924	39	0	147	1,110
Subtotal	2,056	0	4,456	87	6,599	1,714	227	0	147	2,088
Wyoming										
Black Hills	0	0	0	0	0	0	2,736	0	0	2,736
Bridger-Teton	0	0	0	0	0	0	1,497	0	0	1,497
Medicine Bow	124	0	1,472	0	1,596	0	263	0	0	263
Shoshone	0	0	0	0	0	0	546	0	0	546
Targhee	0	0	0	0	0	0	7	0	0	7
Subtotal	124	0	1,472	0	1,596	0	5,049	0	0	5,049
Total	206,741	9,680	58,593	35,141	310,155	99,011	180,870	24,257	1,514	305,652

1/ States not listed had no certification in fiscal year 1984.

2/ Regen. = regeneration, w/ site prep. = with site preparation, w/o site prep. = without site preparation,  
refor. = reforestation, TSI = timber stand improvement.

Table 35--Certification of reforestation and timber stand improvement acreages by Region--fiscal year 1985

Region	Reforestation				Timber stand improvement					
	Plant	Seed	Natural regeneration		Total	Release	Precommercial thinning	Fertilization	Pruning	Total
			With site preparation	Without site preparation						
Northern	25,148	247	6,580	8,386	40,397	4,723	16,342	0	0	21,065
Rocky Mountain	5,104	164	2,430	6,562	14,260	2,208	24,133	0	0	26,341
Southwest	6,394	0	0	828	7,222	2,799	45,372	0	0	48,171
Intermountain	2,581	0	477	374	3,432	1,564	12,817	0	0	14,381
Pacific Southwest	12,851	0	0	166	13,017	3,200	7,611	0	0	10,811
Pacific Northwest	83,465	87	4,515	3,525	91,592	8,229	54,419	19,613	1,357	83,618
Southern	54,562	7,872	23,381	72	85,887	56,183	9,839	4,644	10	70,676
Eastern	16,283	1,310	21,210	4,837	43,640	20,105	8,394	0	147	28,646
Alaska	353	0	0	10,391	10,744	0	1,943	0	0	1,943
Total	206,741	9,680	58,593	35,141	310,191	99,011	180,870	24,257	1,514	305,652

Table 36--Total recreation use on National Forest System lands by State--fiscal years 1981-85

State, Commonwealth, 1/ Territory	1985	1984	1983	1982	1981
	1,000 RVD's 2/				
Alabama	871.9	1,053.7	1,048.0	1,272.0	1,196.0
Alaska	4,851.7	3,519.6	4,144.0	3,571.4	3,219.7
Arizona	14,664.1	16,376.7	16,557.0	16,912.6	17,830.5
Arkansas	2,206.0	2,251.3	2,292.9	2,543.0	2,417.5
California	55,314.3	55,476.3	53,137.1	55,243.8	54,889.7
Colorado	21,115.7	20,734.9	20,037.9	22,361.7	23,068.4
Florida	2,532.9	2,630.0	3,054.0	2,976.9	3,028.3
Georgia	2,304.0	2,275.6	2,271.5	2,182.8	2,110.8
Idaho	10,220.7	10,505.9	10,117.0	10,610.8	11,259.9
Illinois	972.7	801.4	799.0	836.1	823.9
Indiana	393.1	388.7	766.1	792.6	774.8
Kansas	19.2	16.5	14.8	30.9	30.9
Kentucky	2,152.5	2,090.4	2,066.8	2,373.8	2,832.2
Louisiana	430.8	480.2	497.1	479.2	554.9
Maine	47.5	51.6	51.5	51.5	45.8
Michigan	4,133.6	4,652.5	5,398.4	5,652.3	5,646.7
Minnesota	4,391.9	4,302.5	4,387.2	4,492.7	4,617.3
Mississippi	1,115.8	1,246.0	1,365.8	1,279.6	1,261.3
Missouri	1,761.4	1,706.9	1,964.4	1,959.7	1,881.4
Montana	10,020.7	9,388.1	9,380.6	9,549.8	9,541.1
Nebraska	115.1	129.4	130.8	146.1	142.4
Nevada	2,074.1	2,059.1	2,592.7	2,285.9	2,402.6
New Hampshire	2,374.9	2,286.2	2,333.4	2,212.8	2,672.5
New Mexico	6,975.7	6,416.1	6,870.0	6,554.0	6,151.1
New York	22.9	22.3	23.0	22.6	24.5
North Carolina	3,667.7	4,085.7	4,088.6	4,868.4	5,243.5
North Dakota	135.5	357.5	133.7	133.9	133.4
Ohio	375.6	376.3	398.7	486.6	450.1
Oklahoma	377.2	398.8	404.8	405.6	398.4
Oregon	19,060.6	20,139.5	18,245.5	18,038.6	18,298.1
Pennsylvania	1,948.9	2,000.8	2,282.4	2,090.3	2,206.5
Puerto Rico	468.5	530.2	544.5	523.9	552.3
South Carolina	919.3	1,004.1	1,072.3	1,155.4	1,188.2
South Dakota	3,495.4	2,556.1	2,271.1	2,275.2	2,329.8
Tennessee	2,107.2	2,525.2	2,851.0	2,443.7	2,420.0
Texas	1,623.1	1,965.2	1,868.4	1,867.3	1,919.5
Utah	13,914.3	13,621.1	13,330.4	14,790.7	14,417.5
Vermont	850.5	609.2	606.2	743.6	600.3
Virginia	3,511.2	3,516.4	3,993.6	3,629.6	3,553.3
Washington	12,690.2	13,986.8	14,514.5	14,554.6	13,855.4
West Virginia	1,334.0	1,370.4	1,433.2	1,451.8	1,345.7
Wisconsin	1,942.8	1,928.9	1,838.9	1,587.1	2,184.0
Wyoming	5,902.1	5,719.8	6,529.0	5,996.6	6,189.0
Total	225,407.3	227,553.9	227,707.8	233,437.5	235,709.2

1/ States not listed have no Forest Service recreation program.

2/ One recreation visitor-day (RVD) is the recreation use of National Forest land or water that aggregates 12 visitor-hours. This may entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent.

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Table 37—State summary of total recreation use on National Forest System lands by activity—fiscal year 1985

State, 1/ Territory, or Commonwealth	Camping	Picnicking	Travel (mechanized)	Water sports 1,000 RVD's 2/	Winter sports	Fishing	Hunting	Hiking & mountain climbing
Alabama	162.1	48.9	151.5	128.1	0.0	53.7	203.6	57.3
Alaska	250.3	49.7	336.2	1,540.1	102.0	394.2	148.0	223.0
Arizona	3,919.7	603.1	4,815.8	1,103.4	176.1	570.1	586.3	598.8
Arkansas	439.6	99.2	382.7	250.3	0.0	290.4	479.6	93.2
California	13,278.6	1,475.9	13,737.5	3,550.5	4,638.6	3,004.9	1,137.1	2,667.5
Colorado	4,327.9	421.6	4,112.9	229.2	4,533.9	1,269.0	983.3	2,304.2
Florida	934.5	258.2	261.6	336.0	1.1	151.8	189.6	41.7
Georgia	558.5	89.2	484.2	156.3	1.9	233.2	300.7	193.2
Idaho	2,637.7	356.4	2,249.3	514.4	644.2	794.1	778.0	428.7
Illinois	108.5	56.5	169.3	78.1	.1	47.4	118.7	114.8
Indiana	127.4	20.6	40.0	49.3	0.0	51.9	39.0	19.9
Kansas	1.0	2.6	8.2	0.0	.1	2.3	3.5	.6
Kentucky	368.7	90.9	366.8	461.3	.9	249.2	152.5	195.4
Louisiana	84.0	29.6	72.0	33.8	0.0	34.0	97.8	19.3
Maine	13.2	1.9	2.5	1	.8	3.8	7.6	9.1
Michigan	860.8	88.4	1,310.4	359.9	120.0	406.4	552.9	93.7
Minnesota	1,283.1	43.1	567.0	718.7	136.8	652.1	314.8	100.4
Mississippi	168.2	43.7	267.5	77.8	0.0	64.3	379.2	63.2
Missouri	393.1	71.6	378.6	247.9	.1	109.2	278.0	82.0
Montana	1,734.4	276.8	2,427.0	288.1	630.5	799.3	1,036.1	684.4
Nebraska	28.2	11.8	15.8	3.4	.1	5.5	12.1	8.7
Nevada	417.1	160.5	312.2	128.8	204.3	86.3	140.1	113.1
New Hampshire	553.3	54.6	486.4	30.5	406.2	21.7	35.5	486.5
New Mexico	1,518.4	553.1	1,302.9	144.5	731.8	402.6	517.5	486.5
New York	7.8	1.9	1.0	0.0	1.3	1.3	5.1	1.5
North Carolina	663.3	163.4	993.8	247.3	2.1	277.9	442.1	414.0
North Dakota	15.4	5.5	20.4	2.2	1.2	1.3	66.8	2.7
Ohio	37.6	29.1	84.0	20.1	.3	24.6	100.8	34.9
Oklahoma	47.8	24.4	131.5	23.2	0.0	26.0	62.1	17.8
Oregon	5,668.7	582.3	3,828.6	1,133.4	1,027.9	1,107.8	1,033.4	960.3
Pennsylvania	427.0	29.1	337.5	125.8	5.4	252.8	453.7	80.1
Puerto Rico	16.0	209.0	61.0	13.0	0.0	0.0	0.0	72.1
South Carolina	179.0	51.8	244.6	71.6	0.0	61.1	164.5	40.1
South Dakota	141.8	41.4	1,777.5	54.8	34.7	764.9	155.7	115.6
Tennessee	604.3	209.6	418.7	251.9	.6	144.8	158.3	102.9
Texas	425.9	51.6	146.4	147.7	0.0	522.3	204.2	31.0
Utah	4,359.8	647.8	2,672.1	363.6	885.1	1,149.5	786.3	882.4
Vermont	41.8	12.5	61.1	5.2	580.5	5.6	33.2	20.5
Virginia	700.7	188.5	660.2	153.5	5.5	274.0	604.3	247.0
Washington	3,347.2	350.7	2,799.0	321.0	988.2	601.4	801.7	837.7
West Virginia	429.5	38.4	197.8	44.6	2.1	123.3	325.2	69.4
Wisconsin	446.9	29.3	539.6	159.3	20.2	391.9	220.8	34.9
Wyoming	1,413.0	151.1	1,215.2	138.5	328.9	417.4	500.2	427.3
Total	53,141.8	7,725.3	50,448.3	13,708.1	16,213.5	15,845.3	14,609.9	13,477.4

1/ States not listed have no Forest Service recreation program.

2/ One recreation visitor-day (RVD) is the recreation use of National Forest land or water that aggregates 12 visitor-hours. This may entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent.

Horseback riding	Recreation cabin use	Nature study	Sightseeing	Visitor information service users	Other developed site use	Total use	State, 1/ Territory, or Commonwealth
1,000 RVD's 2/							
7.7	0.0	24.0	15.9	15.6	3.5	871.9	Alabama
2.9	104.0	78.4	1,474.5	120.5	27.9	4,851.7	Alaska
216.8	284.1	449.3	395.2	258.4	687.0	14,664.1	Arizona
30.9	7.6	56.1	24.4	35.1	16.9	2,206.0	Arkansas
578.0	3,271.7	993.1	1,919.0	1,233.0	3,828.9	55,314.3	California
406.7	221.6	476.4	1,176.1	158.9	494.0	21,115.7	Colorado
25.0	137.4	49.7	32.9	33.3	80.1	2,532.9	Florida
25.9	28.5	58.3	130.8	16.8	26.5	2,304.0	Georgia
261.6	247.8	555.4	306.7	108.7	337.7	10,220.7	Idaho
53.7	0.0	59.0	144.8	14.3	7.5	972.7	Illinois
30.6	0.0	8.2	1.4	4.8	0.0	393.1	Indiana
.2	0.0	.6	0.0	0.0	.1	19.2	Kansas
31.8	11.2	52.6	94.9	47.5	28.8	2,152.5	Kentucky
5.3	9.8	17.7	2.1	7.4	18.0	430.8	Louisiana
0.0	0.0	2.7	2.2	.7	2.0	47.5	Maine
16.2	78.7	137.9	66.5	25.4	16.4	4,133.6	Michigan
7.5	193.9	112.3	19.8	48.7	193.7	4,391.9	Minnesota
15.0	0.0	19.7	6.3	9.6	1.3	1,115.8	Mississippi
29.3	0.0	89.6	49.9	11.6	20.5	1,761.4	Missouri
415.1	227.9	520.2	473.3	268.3	239.3	10,020.7	Montana
4.3	0.0	8.4	.3	5.2	11.3	115.1	Nebraska
48.9	25.2	83.7	58.1	204.7	91.1	2,074.1	Nevada
.2	0.0	12.8	196.2	12.2	78.8	2,374.9	New Hampshire
133.9	79.3	474.7	292.6	168.0	169.9	6,975.7	New Mexico
1.4	0.0	1.6	0.0	0.0	0.0	22.9	New York
39.0	6.7	89.2	225.0	79.2	24.7	3,667.7	North Carolina
4.2	0.0	3.1	10.2	2.5	0.0	135.5	North Dakota
12.4	0.0	16.4	3.2	9.7	2.5	375.6	Ohio
3.5	0.0	7.5	23.7	9.5	.2	377.2	Oklahoma
200.3	384.4	807.2	1,011.1	421.5	893.7	19,060.6	Oregon
5.3	48.2	49.0	111.6	11.9	11.5	1,948.9	Pennsylvania
0.0	2.0	13.5	15.6	42.3	24.0	468.5	Puerto Rico
19.9	0.0	34.6	23.9	17.6	10.6	919.3	South Carolina
33.1	102.0	50.6	131.7	45.7	45.9	3,495.4	South Dakota
17.5	40.8	32.8	47.4	18.8	58.8	2,107.2	Tennessee
8.6	0.0	17.7	35.4	12.5	19.8	1,623.1	Texas
302.4	281.7	354.3	294.0	115.2	820.1	13,914.3	Utah
1.7	.3	6.4	27.7	4.6	49.4	850.5	Vermont
81.4	0.0	129.3	363.1	46.7	57.0	3,511.2	Virginia
193.9	249.2	496.4	804.6	183.5	715.7	12,690.2	Washington
4.5	.6	24.4	14.9	24.5	34.8	1,334.0	West Virginia
3.5	15.8	60.6	7.0	5.8	7.2	1,942.8	Wisconsin
278.7	180.3	166.6	285.0	64.0	335.9	5,902.1	Wyoming
3,558.8	6,240.7	6,702.0	10,319.0	3,924.2	9,493.0	225,407.3	Total

Table 38—Trail Miles on the National Forest System by State—fiscal years 1983–85 <sup>1/</sup>

State	1983			1984			1985		
	Total Miles	Miles Constructed	Miles Maintained	Total Miles	Miles Constructed	Miles Maintained	Total Miles	Miles Constructed	Miles Maintained
Alabama	154	0	89	230	6	119	230	5	97
Alaska	624	15	609	635	16	620	676	29	647
Arizona	3,546	0	2,305	3,546	14	2,305	3,546	0	1,773
Arkansas	434	2	219	437	3	266	431	0	165
California	11,335	56	10,104	11,030	138	7,728	11,030	160	8,825
Colorado	8,288	3	6,733	8,288	0	6,235	8,288	12	4,903
Florida	267	2	232	267	1	228	268	1	153
Georgia	495	1	354	521	1	435	507	10	482
Idaho	17,714	97	11,607	17,143	95	10,131	16,415	131	8,532
Illinois	201	0	143	203	0	158	205	4	154
Indiana	114	0	63	114	36	63	142	0	78
Kentucky	524	1	250	533	8	619	540	7	184
Louisiana	114	3	42	119	5	39	130	11	80
Maine	78	0	27	78	0	31	78	0	31
Michigan	2,018	52	1,337	2,029	11	1,239	2,044	32	1,303
Minnesota	2,531	83	1,786	2,581	49	1,749	2,647	68	1,791
Mississippi	380	0	167	382	0	131	385	0	86
Missouri	534	59	96	574	17	247	600	13	132
Montana	13,000	169	8,275	13,000	259	6,308	13,000	58	7,191
Nebraska	39	0	31	39	0	30	39	0	27
Nevada	1,668	32	866	1,668	0	931	1,529	60	932
New Hampshire	1,269	0	482	1,269	0	482	1,275	2	485
New Mexico	3,098	6	2,014	3,098	18	2,014	3,098	15	1,549
New York	25	0	13	25	0	13	25	0	13
North Carolina	1,456	7	1,129	1,457	1	576	1,458	12	607
Ohio	97	0	49	117	0	59	117	0	59
Oklahoma	82	0	20	82	0	0	82	0	0
Oregon	7,253	48	6,579	7,253	39	6,254	7,253	88	5,437
Pennsylvania	355	0	355	355	0	355	355	0	355
Puerto Rico	31	1	31	31	3	6	31	0	27
South Carolina	516	68	234	515	1	282	516	3	185
South Dakota	138	3	109	138	28	107	138	24	95
Tennessee	494	8	494	246	0	182	246	0	122
Texas	183	5	180	183	0	271	193	10	187
Utah	5,495	17	3,538	5,108	1	3,304	5,009	19	3,154
Vermont	578	23	289	582	4	291	588	11	294
Virginia	1,893	0	1,401	1,768	5	737	1,763	7	377
Washington	6,998	163	5,070	6,998	81	5,591	6,998	140	5,032
West Virginia	832	10	242	835	1	177	839	3	163
Wisconsin	1,214	24	761	1,255	32	803	1,335	0	882
Wyoming	5,782	1	3,892	5,681	1	3,908	5,419	52	3,760
Total	101,847	959	72,217	100,413	874	65,024	99,468	987	60,349

<sup>1/</sup> Includes work accomplished by Trail, HRP programs, and volunteers.

<sup>2/</sup> Miles constructed includes construction of new trails and reconstruction of existing trails. The predominate activity is reconstruction.

**Table 39—Status of the National Forest System units of the National Wilderness Preservation System—calendar years 1981-85**

State or Commonwealth <u>1/</u>	1985	1984	1983	1982	1981
	<u>1,000 acres <u>2/</u></u>				
Alabama	19	19	19	13	13
Alaska	5,453	5,453	5,453	5,453	5,453
Arizona	1,320	1,320	557	557	557
Arkansas	116	116	25	25	25
California	3,920	3,920	2,139	2,139	2,139
Colorado	2,586	2,586	2,561	2,561	2,561
Florida	73	73	23	23	23
Georgia	47	47	32	32	32
Idaho	3,827	3,827	3,825	3,825	3,825
Indiana	13	13	13	0	0
Kentucky	18	5	5	5	5
Louisiana	9	9	9	9	9
Minnesota	798	798	793	793	793
Mississippi	5	5	0	0	0
Missouri	63	63	47	40	40
Montana	3,366	3,366	3,107	3,107	3,107
Nevada	65	65	65	65	65
New Hampshire	103	103	26	26	26
New Mexico	1,387	1,387	1,402	1,402	1,402
North Carolina	100	100	31	31	31
Oregon	2,077	2,077	1,214	1,214	1,214
Pennsylvania	10	10	0	0	0
South Carolina	17	17	17	17	17
South Dakota	10	10	10	10	10
Tennessee	33	33	8	8	8
Texas	34	34	0	0	0
Utah	780	780	30	30	30
Vermont	59	59	17	17	17
Virginia	65	65	9	9	9
Washington	2,521	2,521	1,501	1,501	1,501
West Virginia	78	78	77	30	30
Wisconsin	44	44	20	20	20
Wyoming	3,086	3,086	2,193	2,193	2,193
Total	32,102	32,089 <u>3/</u>	25,228	25,155	25,155

1/ States not listed have no National Forest System acres in the National Wilderness Preservation System.

2/ Acreage for most States is estimated pending final map compilation.

3/ Includes all acres added to the Wilderness Preservation System through the end of the 98th Congress.

*Table 40—Additions to the National Wilderness Preservation System—fiscal year 1985*

Public Law	State	Date	Number of new areas	Number of additions	Number of adjustments	Acres
P.L. 99-197	Kentucky	12/23	1	--	--	13,300

*Table 41—Additions to the National Wild and Scenic Rivers System—  
fiscal year 1985*

River	State	Date	Miles
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No Additions

**Table 42—Wildlife and fish habitat improvement by Region—fiscal year 1985**

Region	Wildlife	Resident & Anadromous fish	Threatened, endangered, & sensitive species	Knutson- Vandenberg	Total 1/
Northern					
Acres	4,095	469	559	5,576	10,699
Structures	58	569	5	937	1,569
Rocky Mountain					
Acres	14,531	15	101	6,055	20,702
Structures	484	188	48	833	1,553
Southwestern					
Acres	8,475	11	2,301	16,213	27,000
Structures	49	20	13	274	356
Intermountain					
Acres	13,081	2,412	0	131	15,624
Structures	183	357	76	119	735
Pacific Southwest					
Acres	3,874	285	7,127	19,917	31,203
Structures	43	751	84	1,555	2,433
Pacific Northwest					
Acres	6	110	0	17,680	17,796
Structures	2	1,108	0	8,151	9,261
Southern					
Acres	44,245	1,750	19,677	122,762	188,434
Structures	80	253	30	435	798
Eastern					
Acres	21,071	5,555	4,687	6,882	38,195
Structures	933	937	4	379	2,253
Alaska					
Acres	1,595	1,760	0	2,178	5,533
Structures	16	52	0	0	68
Total					
Acres	110,973	12,367	34,452	197,394	355,186
Structures	1,848	4,235	260	12,683	19,026

1/ Does not include activities that are accomplished in support of other resource programs.

**Table 43—Range allotment management status by Region—fiscal year 1985**

Region	Total	Number of allotments		Acres	
		Improved management started	Improved management maintained	Total	Suitable
Northern	1,853	18	1,308	12,132,440	4,185,151
Rocky Mountain	2,529	104	1,813	19,075,936	8,653,072
Southwestern	1,467	52	1,073	21,951,730	12,341,919
Intermountain	1,904	37	1,480	26,297,601	11,298,286
Pacific Southwest	864	69	520	11,665,924	4,903,188
Pacific Northwest	797	35	436	11,803,417	6,589,714
Southern	587	34	455	2,158,231	1,687,061
Eastern	222	2	152	95,352	47,191
	10,223	351	7,237	105,180,631	49,705,582

**Table 44—Range allotment management status—fiscal years 1981-85**

	1985	1984	1983	1982	1981
Total allotment	10,223	10,296	10,417	11,069	10,871
Improved management started (number of allotments)	351	471	534	705	677
Improved management maintained (number of allotments)	7,237	7,018	7,125	6,886	6,705
Total acres (million acres)	105	105	104	105	105
Suitable acres (million acres)	50	51	52	52	56
Permitted use (million AUM's <sup>1/</sup> )	10.1	10.1	10.1	9.9	9.8
Actual use (million AUM's)	8.8	8.8	8.8	8.8	8.8

<sup>1/</sup> An animal unit month (AUM) is the amount of grazing required by a 1,000-pound cow for 1 month.

Table 45—Actual grazing use by State—fiscal year 1985

State or Commonwealth 1/	Cattle	Sheep	Domestic horses	Wild horses AUM's 2/	Wild burros	Total
Alabama	3,643	0	46	0	0	3,689
Arizona	1,253,873	13,589	6,382	0	547	1,274,391
Arkansas	33,188	0	96	0	0	33,284
California	514,393	54,089	14,378	6,430	720	590,010
Colorado	816,342	147,171	24,310	0	0	987,823
Florida	36,782	0	0	0	0	36,782
Georgia	5,133	0	4	0	0	5,137
Idaho	630,142	217,997	13,298	0	0	861,437
Illinois	15,175	2,691	72	0	0	17,938
Indiana	700	0	0	0	0	700
Kansas	43,514	0	102	0	0	43,616
Louisiana	32,956	0	129	0	0	33,085
Michigan	1,313	0	0	0	0	1,313
Minnesota	1,223	0	0	0	0	1,223
Mississippi	8,575	0	0	0	0	8,575
Missouri	28,940	0	23	0	0	28,963
Montana	558,476	19,889	13,539	0	0	591,904
Nebraska	115,176	615	142	0	0	115,933
Nevada	269,329	51,142	2,189	3,030	0	325,690
New Mexico	740,980	33,502	13,669	1,843	0	789,994
New York	9,301	0	1	0	0	9,302
North Carolina	74	0	0	0	0	74
North Dakota	477,707	122	4,502	0	0	482,331
Ohio	607	0	0	0	0	607
Oklahoma	25,369	0	22	0	0	25,391
Oregon	447,882	39,553	4,122	2,448	0	494,005
South Carolina	209	0	0	0	0	209
South Dakota	462,559	4,513	692	0	0	467,764
Texas	72,434	0	78	0	0	72,512
Utah	468,123	193,882	3,189	0	0	665,194
Vermont	292	4	0	0	0	296
Virginia	6,972	23	799	0	0	7,794
Washington	104,919	9,846	3,530	0	0	118,295
West Virginia	11,061	245	22	0	0	11,328
Wisconsin	125	0	0	0	0	125
Wyoming	540,326	150,943	11,776	0	0	703,045
Total	7,737,813	939,816	117,112	13,751	1,267	8,809,759

1/ States not listed had no Forest Service grazing program in 1983.

2/ An animal unit month (AUM) is the amount of grazing required by a 1,000-pound cow for 1 month.

Table 46--Annual grazing statistics--fiscal year 1985

	Permittees 1/		Cattle		Horses and burros		Sheep and goats		Total	
	Number	AUM's 2/	Number	AUM's	Number	AUM's	Number	AUM's	Number	AUM's
Authorized to graze	1,469,296	8,829,812	108,639	99,037	1,481,584	1,196,029	3,059,399	10,124,158		
Actually grazed: Paid permits	15,029	1,401,200	17,601	57,323	1,155,434	934,040	2,574,235	8,702,842		
Free use:										
Recreation stock	72,591	97	111,836	49,806			111,933	50,309		
Other free use	214	2,119	1,255	9,545	863	2,811	4,237	29,312		
Non-NFS lands 3/	(541)	(85,815)	(631)	(6,921)	(25,675)	(27,335)	(112,121)	(513,688)		
Crossing	74	26,620	95	26	26,636	2,897	53,351	7,517		
Unauthorized use	106	3,089	80	412	343	68	3,512	4,761		
Total 3/	88,014	1,433,125	130,867	117,112	1,183,276	939,816	2,747,268	8,794,741		
Wild horses			1,171	13,751			1,171	13,751		
Wild burros			166	1,267			166	1,267		
Total actually grazed 3/	88,014	1,433,125	132,204	132,130	1,183,276	939,816	2,748,605	8,809,759		
Losses:										
Poisonous plants		844	4		1,114		1,962			
Predators		320	2		9,082		9,404			
Other 4/		4,591	63		4,404		9,058			

- 1/ Permittees holding paid permits are not counted in other categories.  
2/ An animal unit month (AUM) is the amount of grazing required by a 1,000-pound cow for 1 month.  
3/ Non-NFS land data not included in totals.  
4/ Includes losses due to thievery, natural death, and accidental death.

**Table 47--Range improvements by type--fiscal year 1985**

Improvement type	Unit of measure	Units of construction completed	Total cost
Structural:			
Water developments	Sites	1,501	2,084,799
Range fence	Miles	1,239	3,424,304
Pipeline	Miles	286	1,090,195
Other structural facilities	Sites	249	601,282
Subtotal		N/A <u>1/</u>	7,200,580
Nonstructural:			
Cover manipulation, brush	Acres	48,195	577,543
Range plant control	Acres	17,325	260,290
Forage improvement	Acres	74,606	864,926
Noxious farm weed control	Acres	20,441	720,183
Subtotal		160,567 <u>2/</u>	2,422,942
Total		N/A	9,623,522

1/ N/A = not applicable.

2/ Acres include 39,500 acres of maintenance burning in Region 8.

**Table 48—Road and bridge construction and reconstruction by State—fiscal year 1985**

State, Commonwealth, or Territory 1/	From appropriated funds			By timber purchasers		
	Roads	Bridges	Cost 2/ 1,000	Roads 3/	Bridges	Cost 1,000
	Miles	Number	dollars	Miles	Number	dollars
Alabama	0.1	2	1,137.0	40.4	0	1,138.0
Alaska	1.6 4/	59 4/	3,567.6 4/	48.6	2	1,639.3
Arizona	21.7	0	6,285.8	257.8	0	1,110.0
Arkansas	12.6	0	3,073.0	148.3	0	4,034.0
California	55.6	3	30,646.1	947.1	6	21,500.0
Colorado	125.5	7	13,109.1	218.1	0	1,104.4
Florida	0.8	0	976.0	74.4	0	1,387.0
Georgia	18.4	8	3,699.0	31.1	0	548.0
Idaho	141.4	8	21,307.6	391.6	0	6,132.9
Illinois	10.8	1	597.1	4.7	0	29.9
Indiana	2.2	0	441.7	13.7	0	253.9
Kentucky	40.0	1	1,714.0	47.2	0	421.0
Louisiana	3.0	0	1,224.0	45.9	0	1,099.0
Maine	0.0	0	82.6	3.0	0	66.6
Michigan	61.5	0	4,573.8	104.7	0	642.9
Minnesota	95.8	3	6,305.3	33.2	0	274.4
Mississippi	0.0	0	1,019.0	167.8	0	1,861.0
Missouri	102.2	0	1,523.7	39.2	0	263.3
Montana	340.0	18	25,755.0	454.0	0	5,728.0
Nebraska	0.1	0	26.9	0.0	0	0.0
Nevada	0.0	3	434.7	0.0	0	0.0
New Hampshire	10.6	0	563.1	11.4	0	250.7
New Mexico	70.0	1	7,388.8	34.7	0	626.2
North Carolina	70.5	0	4,474.0	95.3	0	1,433.0
North Dakota	0.0	0	248.0	0.0	0	0.0
Ohio	6.8	0	486.0	0.4	0	15.2
Oklahoma	0.0	0	121.0	0.0	0	0.0
Oregon	146.4	5	36,172.0	1,536.0	0	38,225.0
Pennsylvania	26.1	3	1,283.2	34.4	0	454.0
Puerto Rico	0.0	0	99.0	0.0	0	0.0
South Carolina	13.9	1	1,176.0	82.3	0	1,389.0
South Dakota	13.3	4	2,275.0	96.1	0	721.0
Tennessee	54.2	12	1,657.0	45.0	0	464.0
Texas	12.0	0	1,071.0	28.6	0	803.0
Utah	55.9	1	2,500.1	59.0	0	459.8
Vermont	4.4	0	445.4	5.0	0	25.5
Virginia	103.7	0	3,823.0	99.4	0	659.0
Washington	42.2	9	18,487.0	370.0	0	12,201.0
West Virginia	82.6	0	2,075.0	19.1	0	380.6
Wisconsin	71.9	0	5,873.6	31.6	0	239.7
Wyoming	40.2	6	5,060.9	92.5	0	306.3
Total	1,858.0	155	222,777.9 5/	5,711.6	8	107,886.6

1/ States not listed had no Forest Service road programs in 1985.

2/ Includes funds for engineering and program support for appropriated roads and timber purchaser roads.

3/ Does not include 473 miles turned back to Forest Service for construction.

4/ Does not include Tongass Timber Supply Fund, \$14,409 thousand, 44.9 miles, and 3 bridges.

5/ Does not include \$6,101 of Washington Office funds.

**Table 49—Timber purchaser roads constructed by the Forest Service by State—fiscal year 1985**

State or Commonwealth 1/	Roads constructed	Cost
	Miles	1,000 dollars
Alabama	18.0	279.0
Arkansas	19.6	678.0
California	17.1	417.0
Colorado	15.5	242.7
Florida	17.3	249.0
Georgia	4.2	215.0
Idaho	37.4	455.2
Kentucky	0.5	5.0
Louisiana	6.1	226.0
Michigan	3.3	20.5
Mississippi	18.8	296.0
Montana	76.0	1,098.0
New Hampshire	6.5	163.3
Ohio	2.2	58.0
Oklahoma	1.2	47.0
Oregon	85.0	1,720.0
Pennsylvania	13.6	116.7
South Carolina	12.8	267.0
South Dakota	62.1	727.3
Texas	11.2	313.0
Utah	11.0	74.0
Virginia	2.0	20.0
Washington	18.0	1,251.0
West Virginia	3.9	19.7
Wisconsin	1.4	21.7
Wyoming	8.3	123.0
Total	473.0	9,103.1

1/ States not listed had no timber purchaser roads constructed by the Forest Service in 1985.

Table 50—State and Private Forestry funding—fiscal year 1985 compared to 1981-85 average

	1985		1981-85	Percent of actual to average
	Actual	RPA	average <u>1/</u>	
	1,000 constant 1984 dollars <u>2/</u>			
Appropriated accounts				
Forest pest management	28,825	40,778	26,935	107
Fire protection	13,739	46,055	15,666	88
Forest management and utilization	10,756	57,690	17,450	62
Special projects	4,972	5,197	5,596	89
Subtotal	58,292	149,720	65,647	89
Transfer accounts				
Rural community fire protection	3,250	-- <u>3/</u>	3,346	97
Watershed and flood prevention	3,580	--	4,255	84
Watershed planning	240	--	287	84
Resource conservation and development	802	--	825	97
River basin surveys and investigations	1,117	--	1,447	77
Forestry incentives program	1,250 <u>4/</u>	--	1,287	97
Agricultural conservation program	1,900 <u>4/</u>	--	1,956	97
Subtotal	12,139	--	13,403	91
Total	70,431	149,720	79,049	89

1/ In order that a comparison may be made with 1982-85, general administration has been eliminated from individual 1981 line items in calculating the average. Total appropriated general administration funds are included in the "General Administration" line item on tables 10 and 11.

2/ Survey of Current Business (BEA) index values used for 1981-84. BEA updates GNP implicit price deflators periodically. These are current as of December 1985.

3/ -- = not reported in the RPA.

4/ Includes only technical assistance allocated for the Forestry Incentives and Agriculture Conservation Programs (administered jointly by ASCS and FS.)

**Table 51—State and Private Forestry funding—fiscal years 1981-85**

	1985	1984	1983	1982	1981 1/
	<u>1,000 dollars</u>				
Appropriated accounts					
Forest pest management	28,825	29,179	27,844	23,760	21,289
Fire protection	13,739	14,016	14,411	14,193	19,666
Forest management and utilization	10,756	10,713	17,080	22,522	23,450
Special projects	4,972	6,845	3,500	5,080	6,762
Subtotal	58,292	60,753	62,835	65,555	71,167
Transfer accounts					
Rural community fire protection	3,250	3,250	3,250	3,250	3,250
Watershed and flood prevention	3,580	3,670	3,670	5,105	4,618
Watershed planning	240	250	250	307	344
Resource conservation and development	802	768	768	722	946
River basin surveys and investigations	1,117	1,229	1,229	1,484	1,957
Forestry incentives program	1,250	1,250 2/	1,250	1,250	1,250
Agricultural conservation program	1,900	1,900 2/	1,900	1,900	1,900
Subtotal	12,139	12,317	12,317	14,018	14,265
Total	70,431	73,070	75,152	79,573	85,432

1/ In order that a comparison may be made with 1982-1985 general administration has been eliminated from individual line items in calculating the average.  
Total appropriated general administration funds are included in the "General Administration" line item on tables 10 and 11.

2/ Includes only technical assistance allocated for the Forestry Incentives and Agriculture Conservation Programs (administered jointly by ASCS and FS.)

Table 52—Summary of State and Private Forestry accomplishments compared to funded output levels—fiscal year 1985

	Unit of measure 1/	1985			Percent of funded	1981-85 average accomplishment	1985 as percent of 5-year average
		Funded	Accomplished				
Appropriated accounts							
Forest pest management 2/	MM acres	592	556	94	626	89	
Insect and disease management surveys	MM acres	-- 3/	1.11	--	2	54	
Insect and disease suppression	Projects	37	37	100	35	106	
Forest management and utilization							
Forest resource management	MM acres	3.4	3.6	106	3.6	99	
Forest land management plans	MM cubic ft.	92.8	243.4	262	245.8	99	
Timber prepared for harvest	M acres	547.9	620.8	113	547.8	113	
Reforestation 4/	M acres	303.2	293.9	97	307.2	96	
Timber stand improvement 4/	M owners	146.6	134.3	92	145.5	92	
Woodland owners assisted	MM cubic ft.	N/A 5/	N/A 5/	--	102.3		
Wood utilization	MM seedlings	--	733.1	--	751.6	98	
Seedling, nursery, and tree improvement	Areas assisted	3,651	5,149	141	3,950.4	130	
Urban forestry assistance							
Management improvement							
State forest resource planning	MM acres	164	126	77	201	63	
Transfer accounts							
Rural community fire protection, FmHA	M approved applications	3.4	3.4	100	3.0	115	
Watershed and flood prevention, SCS 6/	Projects	79	79	100	92.4	86	
Watershed planning, SCS 6/	Plans	65	65	100	56.6	115	
Resource conservation and development, SCS	Projects	50	50	100	56.6	88	
River basin surveys and investigations, SCS 6/	Plans	45	45	100	43.6	103	
Forestry incentives program, ASCS							
Reforestation	M acres	7/	162.9	--	164.3	99	
Timber stand improvement	M acres	7/	34.0	--	61.1	56	
Agricultural conservation program, ASCS							
Reforestation	M acres	7/	86.9	--	62.3	140	
Timber stand improvement	M acres	7/	31.9	--	43.9	73	

1/ M = thousand, MM = million.

2/ Includes accomplishments on National Forest System and other Federal lands, as well as State and private lands.

3/ -- = not applicable.

4/ Includes Forestry Incentives Program and Agricultural Conservation Program accomplishments.

5/ Not all States reported due to lack of State grants.

6/ Level reflects decrease in funding for forestry aspects of SCS projects.

7/ Funded targets for Forestry Incentives and Agricultural Conservation Program were included with those of Rural Forestry Assistance above.

Table 53—Summary of State and Private Forestry accomplishments compared to RPA—fiscal year 1985

	Unit of measure 1/	1985			1981-85 average		
		RPA goal	Accom- plished	Percent of RPA accomplished	RPA goal	Accomplished	Percent of RPA accomplished
Appropriated accounts							
Forest pest management 2/	MM acres	635	556	88	546	626	115
Insect and disease management surveys	MM acres	-- 3/	1.11	--	--	2	--
Insect and disease suppression	Projects	--	37	--	--	35	--
Forest Management and Utilization							
Forest resource management	MM acres	5.2	3.6	69	4.1	3.6	88
Rural forestry assistance	MM cubic ft.	386	243.4	63	311	245.8	79
Forest land management plans	M acres	1,219	620.8	51	966	547.8	57
Timber prepared for harvest	M acres	742	293.9	40	618	307.2	50
Reforestation 4/	M owners	300	134.3	45	245	145.5	59
Timber stand improvement 4/	MM cubic ft.	234	N/A 5/	N/A	184	102.3	56
Woodland owners assisted	MM cubic ft.	--	733.1	--	--	751.6	--
Wood utilization	MM seedlings	--	5,149	--	--	3,950.4	--
Seedling, nursery and tree improvement	Areas assisted	--					
Urban forestry assistance							
Management improvement							
State forest resource planning	MM acres	164	126	77	152	201	135
Transfer accounts							
Rural community fire protection, FmHA	M approved applications	4.2			3.3	2.4	71
Watershed and flood prevention, SCS 6/	Projects	187	79	42	174	92	53
Watershed planning, SCS 6/	Plans	138	65	47	117	57	48
Resource conservation and development, SCS 6/	Projects	70	50	71	70	57	81
River basin surveys and investigations, SCS 6/	Plans	46	45	97	47	44	92
Forestry Incentives Program, ASCS							
Reforestation	M acres	-- 7/	162.9	-- 7/	-- 7/	164.3	-- 7/
Timber stand improvement	M acres	-- 7/	34.0	-- 7/	-- 7/	61.1	-- 7/
Agricultural conservation program, ASCS							
Reforestation	M acres	-- 7/	86.9	-- 7/	-- 7/	62.3	-- 7/
Timber stand improvement	M acres	-- 7/	31.9	-- 7/	-- 7/	43.9	-- 7/

1/ M = thousand, MM = million.

2/ Includes accomplishments on National Forest System and other Federal lands, as well as State and private lands.

3/ -- = not applicable; goals for these items were not included in the RPA.

4/ Includes Forestry Incentives Program and Agricultural Conservation Program accomplishments.

5/ Not all States reported due to lack of State grants.

6/ Level reflects decrease in funding for forestry aspects of SCS projects.

7/ RPA and funded targets for Forestry Incentives and Agricultural Conservation Program were included with those of Rural Forestry Assistance above.

Table 54—Pesticide Use Report—fiscal year 1985

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
Herbicides:			
Amitrole	Noxious Weed Control	232.00	154.00
	Poisonous Plant Control	10.00	4.00
Ammonium Sulfamate	Noxious Weed Control	57.00	.80
	Poisonous Plant Control	24.00	4.00
	Wildlife Habitat Improvement	131.00	26.00
Arsenal	Rights-Of-Way	18.00	24.00
Asulam	Noxious Weed Control	65.00	10.00
Atrazine	Conifer Release	87.00	87.00
	Noxious Weed Control	8.00	5.00
	Range Management Improvement	58.00	41.00
	Rights-Of-Way	394.00	394.00
	Site Preparation	2.00	5.00
Bifenox	Nursery Weed Control	181.33	59.90
Bromacil	General Weed Control	11.00	5.00
	Noxious Weed Control	14.00	9.00
Cacodylic Acid	Hardwood Release	48.00	8.00
Copper Sulfate	Aquatic Weed Control	25.00	1.00
Dacthal	Nursery Weed Control	483.87	44.28
Dalapon	General Weed Control	20.00	4.00
	Research	24.00	4.00
	Site Preparation	74.00	233.00
Dicamba	Aquatic Weed Control	17.00	20.00
	Conifer Release	11.00	49.00
	General Weed Control	12.00	2.00
	Noxious Weed Control	860.50	504.00
	Range Management Improvement	60.00	30.00
	Rights-Of-Way	120.00	24.00
	Site Preparation	1941.50	1916.00
Dichlobenil	General Weed Control	8.00	2.00
	Hardwood Release	4.00	1.00
Diphenamid	Nursery Weed Control	408.60	20.00
Diquat	Aquatic Weed Control	58.00	62.00
Diuron	Firebreak Management	7.00	1.00
	General Weed Control	25.00	17.00
Endothall	Aquatic Weed Control	258.00	21.00
EPTC	Noxious Weed Control	16.00	5.00
Fosamine Ammonium	Noxious Weed Control	7.00	25.00
	Rights-Of-Way	2793.00	447.00
	Rights-Of-Way	1076.00	101.00 Side Miles
	Wildlife Habitat Improvement	77.00	35.00
Glyphosate	Aquatic Weeds Control	120.00	165.00
	Bracken Fern Control	15.00	5.00
	Conifer Release	12653.25	9507.00
	General Weed Control	882.40	478.05
	Hardwood Release	81.24	1059.00
	Noxious Weed Control	1624.85	1260.17
	Nursery Weeds Control	494.00	204.44
	Poisonous Plant Control	54.00	82.00
	Range Management Improvement	83.00	76.00
	Research	215.06	250.00
	Rights-Of-Way	451.00	139.00
	Site Preparation	1650.00	550.00 Acre Feet
	Site Preparation	8668.35	4250.00
	Wildlife Habitat Improvement	211.00	182.00
Hexazinone	Conifer Release	54511.00	34619.00
	Noxious Weed Control	13.00	22.00

See footnotes at end of table.

Table 54—Pesticide Use Report—fiscal year 1985—Continued

Common name	Target pest/ purpose	Quantity used/treated		
		Pounds <u>1/</u>	Units <u>2/</u>	
Herbicides: (Cont.)				
Hexazinone	Nursery Weed Control	24.00	13.00	
	Range Management Improvement	78.00	100.00	
	Research	3.00	2.00	
	Rights-Of-Way	4.00	5.00	
	Site Preparation	41792.60	17029.00	
	Wildlife Habitat Improvement	1009.00	660.00	
Linuron	General Weed Control	200.00	100.00	
Maleic Hydrazide	Rights-Of-Way	978.00	51.00	
MCPA	Rights-Of-Way	4.00	1.00	
Mefluidide	Rights-Of-Way	31.00	58.00	
Metolachor	General Weed Control	200.00	100.00	
Monuron	Rights-Of-Way	66.00	1200.00	
MSMA	General Weed Control	12.00	8.00	
	Noxious Weed Control	20.00	12.00	
	Rights-Of-Way	1496.00	628.00	
	Thinning	45.00	122.00	
	Napropamide	Nursery Weeds Control	124.50	95.30
Oryzalin	Rights-Of-Way	24.00	7.00	
	Site Preparation	45.00	12.50	
	Oust	Conifer Release	45.00	218.00
	General Weed Control	99.59	740.00	
	Noxious Weed Control	.20	1.40	
	Poisonous Plant Control	.01	5.00	
	Right-Of-Way	28.94	103.00	
	Site-Preparation	47.25	280.00	
	Paraquat	General Weed Control	1.50	1.00
	Picloram	Conifer Release	29.00	61.00
		Noxious Weeds Control	21948.07	5130.29
Poisonous Plant Control		159.03	279.00	
Range Management Improvement		490.00	1081.00	
Rights-Of-Way		196.00	148.00	
Site Preparation		440.00	148.00	
Thinning		25.00	25.00	
Wildlife Habitat Improvement		2022.00	2117.00	
Prometon		General Weed Control	2.00	.50
Sethoxydin		Nursery Weeds Control	75.00	82.00
Simazine	Aquatic Weed Control	60.00	13.20	
	Aquatic Weed Control	4.00	1.00	
	Conifer Release	348.00	87.00	
	General Weed Control	62.00	17.75	
	Hardwood Release	62.00	26.00	
	Noxious Weed Control	24.00	8.00	
	Nursery Weed Control	35.00	16.00	
	Research	40.00	8.00	
	Rights-Of-Way	18.00	2.00	
	Tebuthiuron	General Weed Control	3.00	1.00
	Range Management Improvement	13.00	250.00	
	Rights-Of-Way	1114.00	265.00	
	Telar	Rights-Of-Way	2.00	76.00
	Triclopyr	Conifer Release	10,343.80	5927.50
Hardwood Release		5.00	5.00	
Range Management Improvement		5.00	5.00	
Research		459.00	236.00	
Rights-Of-Way		1114.00	712.00	
Site Preparation		9248.60	6550.00	
Thinning		18.00	34.00	
Wildlife Habitat Improvement		227.00	602.00	

See footnotes at end of table.

**Table 54—Pesticide Use Report—fiscal year 1985—Continued**

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
Herbicides: (Cont.)			
Trifluralin	Noxious Weed Control	20.00	10.00
2,4-D	Aquatic Weed Control	20.00	10.10
	Conifer Release	5899.50	1412.50
	General Weed Control	712.00	898.00
	Hardwood Release	1428.00	595.00
	Noxious Weed Control	4406.12	3678.20
	Noxious Weed Control	84.00	35.20
	Nursery Weed Control	157.90	121.50
	Poisonous Plant Control	505.00	255.00
	Range Improvement	5817.00	3089.00
	Research	3.00	1.00
	Rights-Of-Way	849.00	599.00
	Site Preparation	7417.00	2641.00
	Thinning	2757.00	733.00
	Wildlife Habitat Improvement	5502.00	1555.00
2,4-DP	Conifer Release	3903.00	1253.00
	Site Preparation	791.00	411.00
Amitrole/ Simazine	Rights-Of-Way	42.00	20.00
		7.88	
Amitrole/ Simazine	Site Preparation	7.00	16.00
		20.00	
Amitrole/ 2,4-D	Noxious Weed Control	10.00	15.00
		20.00	
Amitrole/ 2,4-D/ Dicamba	Noxious Weed Control	73.00	290.00
		435.00	
		145.00	
Atrazine/ Simazine/ Glyphosate	Site Preparation	30.00	56.00
		30.00	
		30.00	
Bromacil/ Diuron	Noxious Weed Control	1.50	1.00
		1.50	
Bromacil/ Picloram	Rights-Of-Way	240.00	195.00
		65.00	
Dicamba Picloram	Noxious Weed Control	44.00	44.00
		22.00	
Diuron/ Oust	Rights-Of-Way	18.00	3.00
		.56	
Glyphosate/ Oust	Site Preparation	1259.00	1016.00
		22.00	
Hexazinone/ Oust	Noxious Weed Control	2.10	37.00
		1.50	
Mefluidide/ Dicamba/ Triclopyr	General Weed Control	3.00	2.00
		.03	
		204.00	
MSMA/ Triclopyr	Conifer Release	108.00	193.00
		66.00	
Simazine/ Glyphosate	Hardwood Release	155.00	37.00
		109.00	
Simazine/ Prometon/ Sodium Clorate/ Sodium Metaborate	General Weed Control	.30	2.00
		2.00	
		16.00	
		20.00	
2,4-D/ Dicamba	Noxious Weed Control	2457.88	1908.70
		1124.79	

See footnotes at end of table.

**Table 54—Pesticide Use Report—fiscal year 1985—Continued**

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
Herbicides: (Cont.)			
2,4-D/ Dicamba	Nursery Weed Control	66.66 33.33	100.00
2,4-D/ Dicamba	Poisonous Plant Control	24.00 6.00	15.00
2,4-D/ Dicamba	Range Management Improvement	50.00 18.00	30.00
2,4-D/ Dicamba	Rights-Of-Way	90.00 10.00	10.00
2,4-D/ Dicamba	Site Preparation	308.00 162.00	54.00
2,4-D/ Dicamba	Wildlife Habitat Improvement	20.00 10.00	110.00
2,4-D/ Dicamba/ Picloram	Noxious Weed Control	181.00 191.00 356.00	458.00
2,4-D/ Glyphosate/ Oust	Rights-Of-Way	12.00 48.00 72.00	24.00
2,4-D/ MCPA	General Weed Control	6.00 6.75	4.00
2,4-D/ Picloram	Conifer Release	9352.19 2619.10	5012.00
2,4-D/ Picloram	Hardwood Release	257.00 65.00	536.00
2,4-D/ Picloram	Noxious Weed Control	2629.88 1024.69	4256.23
2,4-D/ Picloram	Noxious Weed Control	91.50 21.25	87.50 Side Miles
2,4-D/ Picloram	Poisonous Plant Control	8.00 2.00	760.00
2,4-D/ Picloram	Range Management Improvement	386.00 2.25	209.00
2,4-D/ Picloram	Rights-Of-Way	469.00 169.00	469.00
2,4-D/ Picloram	Site Preparation	12786.00 5202.00	12354.00
2,4-D/ Picloram	Site Preparation	9.00 2.00	500.00 Trees
2,4-D/ Picloram	Wildlife Habitat Improvement	902.00 228.00	2125.00
2,4-D/ Picloram	Research	18.19 15.15	110.00
2,4-D/ Picloram/ Triclopyr	Rights-Of-Way	378.00 108.00 274.00	146.00
2,4-D/ Picloram/ Triclopyr	Site Preparation	114.00 30.00 120.00	58.00
2,4-D/ Triclopyr	Rights-Of-Way	180.00 148.00	61.00
2,4-D/ 2,4-DP	Conifer Release	270.75 270.75	344.00
2,4-D/ 2,4-DP	Hardwood Release	252.00 252.00	63.00

See footnotes at end of table.

Table 54--Pesticide Use Report--fiscal year 1985--Continued

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
<u>Herbicides: (Cont.)</u>			
2,4-D/ 2,4-DP	Rights-Of-Way	968.25	299.50
2,4-D/ 2,4-DP	Site Preparation	1130.00	461.00
2,4-D/ 2,4-DP/ Triclopyr	Conifer Release	6.00	2.00
		6.00	
		6.00	
Total 1985 Herbicide Use		278,031.55	151,224.61
<u>Insecticides:</u>			
Amdro	Imported Fire Ant	4.00	10.00 (A)
Azinphos-Methyl	Seed & Cone Insects	3501.00	11000.00 (A) Trees
	Seed & Cone Insects	5101.00	882.00 (A)
<u>Bacillus thuringiensis</u>	Gypsy Moth	1177440.00 BIU	73590.00 (A)
	Western Spruce Budworm	1408188.00 BIU	99099.00 (A)
Carbaryl	Grasshoppers	12500.00	25000.00 (A)
Diflubenzuron	Gypsy Moth	790.00	3000.00 (A)
Lindane	Bark Beetles	314.00	3500.00 (A) Trees
Malathion	Grasshoppers	362836.00	596885.00 (A)
Pheromones	Douglas-Fir Beetle	32.02	400.00 (A)
	Gypsy Moth	4.28	194.00 (A)
Acephate	Western Spruce Budworm	2.40	121.00 Trees
Amdro	Imported Fire Ant	.75	950.00 Ant Colonies
Azinphos-Methyl	Cone and Seed Insects	1200.00	300.00
<u>Bacillus thuringiensis</u>	Mosquitoes	.14	10.60
	Western Spruce Budworm	4800.00 BIU	20.00
Bendiocarb	Fleas	15.57	185.00 Burrows
Carbaryl	Aphids	4.00	2000.00 Seedlings
	Cattle Ticks & Lice	10.00	25.00
	Cottonwood Leaf Beetle	1.00	1.00
	Cutworms	.02	60.00 Square Feet
	Defoliators of Conifers	22.50	22.50
	Fleas	200.00	150.00
	Grasshoppers	9.75	32.00
	Greenhouse Insects	.44	535.00 Square Feet
	Mountain Pine Beetle	67.00	13.00
	Mountain Pine Beetle	7028.00	26783.00 Trees
	Nursery Insects	11.00	11.00
Carbofuran	Cone Borers	322.00	845.00 Trees
	Cone Moth	54.00	23.00
	Seedbugs	3.80	.10
	Seedbugs	1.25	20.00 Trees
	Weeviles	1.25	.30
Chlordane	Miscellaneous Insects	4.00	4.00 Buildings
Chlorpyrifos	Pales Weevil	24.00	96.00
	Southern Pine Beetle	54.00	1498.00 Trees
	Webworms	28.00	14.00
Coumaphos	Cattle Ticks & Lice	225.00	900.00 Cattle
Diazion	Aphids	16.04	8.20

See footnotes at end of table.

**Table 54—Pesticide Use Report—fiscal year 1985—Continued**

Common name	Target pest/ purpose	Quantity used/treated		
		Pounds <u>1/</u>	Units <u>2/</u>	
<u>Insecticides: (Cont.)</u>				
Diazion	Carpenter Ant	1.30	4.00 Buildings	
	Cutworms	156.00	.39	
	Defoliators of Conifers	.16	2200.00 Square Feet	
	Fleas	.42	100.00 Bait Stations	
	Imported Fire Ant	.25	23.00 Ant Colonies	
	Mosquitoes	1.00	1.00 Buildings	
	Nursery Insects	112.00	82.00	
	Spider Mites	.04	195.00 Seedling	
	Gypsy Moth	281.00	8991.00	
	Pine Tip Moth	.31	2200.00 Square Feet	
Dicofol	Tip Moths	12.00	24.00	
	Nursery Insects	1.40	14.00	
Diflubenzuron	Ambrosia Beetle	10.00	1000.00 Trees	
Dimethoate	Balsalm Woolly Aphid	6.40	12.00	
	Bark Beetles	854.00	50.00	
	Bark Beetles	830.00	1300.00 Trees	
	Mountain Pine Beetle	685.00	5460.00 Trees	
	Southern Pine Beetle	60.00	20.00	
	Southern Pine Beetle	1.65	4.00 Tree Groups	
	Southern Pine Beetle	9.00	677.00 Trees	
	Western Pine Beetle	82.00	22000.00	
	Aphids	2.75	.30	
	Aphids	2.34	500000.00 Seedlings	
	Aphids	.01	40.00 Trees	
	Fleas	5.10	20.00 Buildings	
	Greenhouse Insects	.16	128.00 Square Feet	
	Miscellaneous Insects	5.10	20.00 Buildings	
	Mosquitoes	149.33	112.00	
	Sawflies	1.00	1.00	
	Seedbugs	260.00	60.00	
Fenvalerate	Spider Mites	20.20	262.00 Seedlings	
	Miscellaneous Insects	4.00	18.00	
	Texas LeafCutting Ant	298.00	42.00 Ant Colonies	
	Lindane		6.00	
		Aphids	.04	10000.00 Seedlings
		Greenhouse Insects	.04	4.00 Greenhouses
		Seedbugs	1.00	13.00 Trees
		Mosquitoes	243.00	55.30
		Tussock Moth	.28	125.00 Bait Stations
		Pales Weevil	100.00	40000.00 Seedlings
Ants		10.00	1.00	
Miscellaneous		2.31	6.00 Buildings	
Pine Tip Moth		49.00	12.00	
Malathion	Cattle Ticks & Lice	8.00	363.00 Cattle	
Total 1985 Insecticide Use (Including Aerial Use)		398,639.80	831,239.69	
Total Aerial Use		385,082.30	799,060.00	
<u>Fungicides and Fumigants:</u>				
Benomyl	Botrytis	59.10	210.00	
	Damping-Off	15.00	5.00	
	Diplodia Tip Blight	9.00	17.00	

See footnotes at end of table.

**Table 54—Pesticide Use Report—fiscal year 1985—Continued**

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
<u>Fungicides and Fumigants: (Cont.)</u>			
Benomyl	Nursery Root Rot	65.00	82.00
	Phomopsis Canker	37.75	75.18
	Seedlings Blights	39.00	2.67
	Damping-Off	2.00	10000.00 Seedlings
	Greenhouse Diseases	1.00	1.00 Greenhouses
	Nursery Fungi	1.75	3000.00 Seedlings
Borax	Fomes Annosus	3.00	1.00
	Fomes Annosus	4378.80	20453.00 Stumps
Borax/ Sodium Chlorate/ Sodium Metaborate	Fomes Annosus	10.00	30.00 Trees
		10.00	
Bordeaux Mixture Captan	Diplodia Tip Blight	3.00	2.00
	Damping-Off	34.00	6.00
	Nursery Root Rot	135.00	82.00
	Greenhouse Diseases	47.00	15.00 Greenhouses
	Greenhouse Diseases	.70	760.00 Square Feet
	Nursery Fungi	3.50	3500.00 Seedlings
	Nursery Fungi	.92	3613.00 Square Feet
	Seed Mold, Mildew, or Decay	3.04	3615.70 LBS. of Seed
Chlorothalonil	Botrytis	326.00	243.00
	Diplodia Tip Blight	8.00	6.00
	Nursery Blight	16.68	2.67
	Nursery Root Rot	133.00	82.00
	Phoma Blight	215.10	14.23
	Scleroderris	526.00	224.00
	Nursery Root Rot	382.00	711.00
Chloropicrin/ Dichloropropene		1668.00	
Dazomet	Nursery Fungi	9.50	1200.00 Square Feet
DCNA	Botrytis	16.65	17.00
	Botrytis	27.75	15.00 Greenhouses
	Botrytis	1.50	131000.00 Seedlings
Dodine	Other Diseases	2.00	1.00
	Shot Hole Disease	8.00	6.00
Maneb	Lophodermium Needle Blight	177.00	67.00
Metalaxyl	Damping-Off	.30	500000.00 Seedlings
	Nursery Root Rot	112.40	95.25
Methyl Bromide/ Chloropicrin	Botrytis	240.00	1.00
		120.00	
Methyl Bromide/ Chloropicrin	Damping-Off	3614.65	16.60
		1780.35	
Methyl Bromide/ Chloropicrin		25.00	2400.00 Square Feet
		12.50	
Methyl Bromide/ Chloropicrin	Fusarium	7424.00	21.15
		3712.00	
Methyl Bromide/ Chloropicrin	Nematodes	7300.84	31.00
		3650.16	
Methyl Bromide/ Chloropicrin	Nursery Fungi	16208.52	78.00
		8104.26	
Methyl Bromide/ Chloropicrin	Nursery Fungi	3710.00	15.90 Square Feet
		1855.00	
Methyl Bromide/ Chloropicrin	Nursery Fungi	16.00	1.00 Treatment Stat
		8.00	

See footnotes at end of table.

Table 54—Pesticide Use Report—fiscal year 1985—Continued

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
<u>Fungicides and Fumigants: (Cont.)</u>			
Methyl Bromide/	Nursery Root Rot	15577.00	95.80
Chloropicrin		7789.00	
Methyl Bromide/	Other Diseases	8.67	635.50 Cubic Feet
Chloropicrin		4.33	
Methyl Bromide/	Research	21.00	256.00 Square Feet
Chloropicrin		.11	
Thiram	Damping-Off	86.00	5834.00 LBS. of Seed
Terrazole	Damping-Off	16.80	7.00
Triadimefon	Nursery Root Rot	115.00	61.00
	Other Diseases	.11	2400.00 Square Feet
Total 1985 Fungicide and Fumigant Use		89,908.63	2,263.55
<u>Predacides and Piscicides:</u>			
Antimycin	Undesirable Fish	1.60	19.00 Stream miles
Rotenone	Undesirable Fish	44.00	9.00 Acre Feet
	Undesirable Fish	26.59	78.10 Stream Miles
Sodium Cyanide	Coyote	8.27	30000.00
	Coyote	.10	55.00 Bait Stations
Total 1985 Predacide and Piscicide Use		80.56	30,000.00
<u>Repellents:</u>			
Putrescent Egg Solids	Deer	3691.00	14533.00
	Deer	15.18	63900.00 Seedlings
	Elk	196.00	558.00
Thiram	Birds	25.00	1.69
	Birds	446.00	5025.00 LBS. of Seed
	Deer	.25	5.00 Acres
	Elk	.06	1.00
Total 1985 Repellent Use		4,373.49	15,093.69
<u>Rodenticides:</u>			
Aluminum Phosphide	Ground Squirrels	1.00	257.00 Burrows
	Prairie Dogs	4.00	49.00
Diphacinone	Ground Squirrels	2.00	135.00
	Mice	.20	30.00 Bait Stations
Stryhnine	Pocket Gophers	519.92	60200.00
	Pocket Gophers	.13	95.00 Burrows
Thiram	Mice	25.00	335.70 LBS. of seed

See footnotes at end of table.

**Table 54—Pesticide Use Report—fiscal year 1985—Continued**

Common name	Target pest/ purpose	Quantity used/treated	
		Pounds <u>1/</u>	Units <u>2/</u>
<u>Rodenticides: (Cont.)</u>			
Thiram	Other Rodents	63.00	299.00 LBS. of seed
	Rabbits	2114.00	1060.00
Warfarin	Mice	.60	7.00 Buildings
Zinc Phosphide	Kangaroo Rat	.01	50.00 Burrows
	Mice	6.00	12.00
	Prairie Dogs	134.01	10743.00
Total 1985 Rodenticide Use		2,869.33	72,199.00
Grand Total Pesticide Use		773,803.36	1,102,020.50

1/ Quantities expressed in pounds unless otherwise indicated.

2/ Units treated are expressed in acres unless otherwise indicated.

Aerial applications are indicated by (A). All others are ground application.

3/ Plus 1,263 cattle, 52,247 trees, 59 buildings, and 912,457 seedlings and 1,015 Ant Colonies.

4/ Plus 30 trees, 647,500 seedlings, 9,450 pounds of seed, 20,453 stumps and 31 greenhouses.

**Table 55—Wildfires on State and private lands protected under the Cooperative Forestry Assistance Act (P.L. 95-313)—calendar year 1985**

State, Territory, or Commonwealth	Area protected	Human-caused fires	Human-caused area burned
	<u>1,000 acres</u>		<u>Acres</u>
Alabama	25,029	8,659	106,814
Alaska	66,301	433	4,343
Arizona	18,328	297	3,421
Arkansas	19,728	1,611	26,807
California	32,833	7,281	95,940
Colorado	25,958	594	5,283
Connecticut	2,390	1,540	3,858
Delaware	557	20	95
Florida	27,102	6,397	77,281
Georgia	27,279	10,094	37,668
Guam	82	499	1,536
Hawaii	3,306	177	9,697
Idaho	6,026	211	2,003
Illinois	8,453	18	219
Indiana	7,328	186	1,188
Iowa	7,612	768	1,747
Kansas	19,793	5,452	54,109
Kentucky	16,936	1,418	17,254
Louisiana	20,939	5,606	60,891
Maine	17,743	887	4,480
Maryland	3,700	565	8,784
Massachusetts	3,581	5,331	5,439
Michigan	19,675	595	4,040
Minnesota	22,830	1,344	61,544
Mississippi	19,858	7,083	88,697
Missouri	16,587	2,176	19,953
Montana	34,839	243	51,028
Nebraska	27,154	878	8,830
Nevada	8,777	168	1,785
New Hampshire	4,631	869	331
New Jersey	2,735	953	1,806
New Mexico	40,199	208	19,116
New York	16,957	312	1,512
North Carolina	20,817	3,469	19,333
North Dakota	31,495	277	11,603
Ohio	5,823	599	1,942
Oklahoma	5,085	1,477	32,233
Oregon	13,099	548	1,307
Pennsylvania	19,541	796	3,866
Puerto Rico	829	0	0
Rhode Island	512	148	406
South Carolina	13,038	7,708	31,342
South Dakota	20,653	519	24,822
Tennessee	1,288	2,715	20,575
Texas	22,123	2,149	35,376
Utah	14,724	126	3,372
Vermont	4,638	227	408
Virginia	18,519	3,321	3,599
Washington	13,177	675	3,611
West Virginia	12,833	1,341	15,232
Wisconsin	18,898	1,623	5,486
Wyoming	21,341	469	10,482
Total	833,679	101,060	1,012,494

**Table 56—Summary of selected cooperative forest management and processing program activities—selected fiscal years**

	Woodland owners assisted	Timber sale assistance-- volume marked MBF <sup>1/</sup>	Loggers and processors assisted
1945	8,093	411,330	0
1950	22,828	518,566	0
1955	34,828	549,373	8,182
1960	82,188	569,178	8,099
1965	99,074	716,950	9,248
1970	115,197	1,225,520	13,620
1971	127,828	860,950	14,627
1972	274,001	955,627	5,290
1973	106,422	1,578,664	4,855
1974	117,990	907,311	5,353
1975	140,940	677,532	5,405
1976	105,184	596,599	15,318
1976-77 (T.Q.) <sup>2/</sup>	25,253	220,649	5,849
1977	133,619	921,171	29,101
1978	165,329	1,120,743	12,749
1979	183,585	755,103	11,393
1980	176,385	870,964	11,582
1981	164,279	683,181	18,609
1982	141,472	841,475	15,470
1983	136,265	872,125	8,717
1984	151,539	1,033,440	10,082 <sup>3/</sup>
1985	134,338	913,411	-- <sup>4/</sup>

<sup>1/</sup> MBF = thousand board feet.

<sup>2/</sup> Transition quarter.

<sup>3/</sup> Not all states reported.

<sup>4/</sup> Inadequate data due to lack of State grants in wood utilization program.

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*Table 57—Summary of selected cooperative forest management and processing activities by Region—fiscal year 1985*

Assistance activity	Unit of measure <u>1/</u>	Regions				
		Northern	Rocky Mountain	South-western	Inter-mountain	Pacific Southwest
Woodland owners assisted	Number	2,221	4,907	351	585	4,203
Assists to loggers and processors	Number	-- <u>2/</u>	--	--	--	--
Forest management plans prepared	Number M acres	458 36,646	702 32,229	95 68,866	54 21,649	206 47,239
Reforestation:						
Planting	Acres	488	855	1,277	753	5,453
Seeding	Acres	0	5	25	200	4
Management for natural regeneration	Acres	18	2,057	2,060	150	3,346
Timber stand improvement	Acres	837	2,078	252	905	4,524
Outdoor recreation development	Acres	1	2,997	57,321	4,651	4,254
Wildlife habitat development	Acres	1,524	5,546	49,651	2,260	12,865
Forested range improvement	Acres	3,336	2,928	49,845	12,370	13,309
Timber sale assistance volume harvested	M cubic feet	1,543	6,831	2,647	511	2,954
Improved utilization:						
Harvesting	M cubic feet	--	--	--	--	--
Primary processing	M cubic feet	--	--	--	--	--
Secondary processing and drying	M cubic feet	--	--	--	--	--
Fuel and byproducts	M cubic feet	--	--	--	--	--
Urban forestry assistance activities	Urban areas assisted	136	606	11	176	902
Referrals to consulting foresters	Number	65	395	9	12	740

See footnotes at end of table.

**Table 57—Summary of selected cooperative forest management and processing activities by Region—  
fiscal year 1985--Continued**

Assistance activity	Unit of measure <sup>1/</sup>	Regions			North- eastern Area	Total
		Pacific Northwest	Alaska	Southern Region		
Woodland owners assisted	Number	6,306	320	58,201	57,244	134,338
Assists to loggers and processors	Number	--	--	--	--	--
Forest management plans prepared	Number M acres	1,126 97,064	78 10,000	28,577 2,161,534	21,773 1,109,869	53,069 3,585,096
Reforestation:						
Planting	Acres	20,691	300	442,800	37,276	509,893
Seeding	Acres	0	0	12,191	566	12,991
Management for natural regeneration	Acres	7,670	0	53,845	28,730	97,876
Timber stand improvement	Acres	46,650	64	182,299	56,295	293,904
Outdoor recreation development	Acres	0	240	71,622	52,599	193,685
Wildlife habitat development	Acres	3,616	750	227,184	127,799	431,195
Forested range improvement	Acres	3,288	0	20,919	10,302	116,297
Timber sale assistance volume harvested	M cubic feet	10,051	2,908	119,565	96,367	243,377
Improved utilization:						
Harvesting	M cubic feet	--	--	--	--	--
Primary processing	M cubic feet	--	--	--	--	--
Secondary processing and drying	M cubic feet	--	--	--	--	--
Fuel and byproducts	M cubic feet	--	--	--	--	--
Urban forestry assistance activities	Urban areas assisted	34	2	797	2,485	5,149
Referrals to consulting foresters	Number	176	16	7,366	7,470	16,249

<sup>1/</sup> M = thousand.

<sup>2/</sup> -- = Inadequate data due to lack of State grants in wood utilization program.

**Table 58—Summary of selected cooperative forest management and processing activities by State—fiscal year 1985**

State, Territory, or Commonwealth	Woodland owners assisted	Reforesta- tion assistance	Timber stand improvement assistance	Timber sale assistance-- harvest volume	State nursery production
		Acres	Acres	1,000 cubic feet	1,000 trees
Alabama	8,000	47,017	37,485	4,176	60,000
Alaska	320	300	64	2,908	394
Arizona	116	1,131	187	23	0
Arkansas	1,640	20,505	2,899	285	14,095
California	3,823	8,418	4,511	2,530	3,133
Colorado	1,420	1,886	347	4,577	1,446
Connecticut	1,088	1,758	443	561	1,962
Delaware	627	1,811	78	981	100
Florida	3,569	60,314	13,697	2,974	72,228
Georgia	7,628	76,439	7,249	3,725	122,179
Guam	17	17	5	0	40
Hawaii	363	368	8	424	397
Idaho	1,057	287	364	527	439
Illinois	2,805	1,710	4,490	722	2,570
Indiana	2,760	5,413	6,457	1,717	4,335
Iowa	1,183	2,006	1,125	583	2,893
Kansas	942	389	519	500	176
Kentucky	1,103	3,676	2,559	2,276	11,700
Louisiana	1,443	15,864	18,000	1,069	63,000
Maine	1,356	1,729	1,325	2,495	2,050
Maryland	5,713	8,649	4,659	16,902	3,938
Massachusetts	2,643	14,062	3,959	12,349	0
Michigan	1,434	2,569	1,677	2,829	3,100
Minnesota	5,557	8,798	3,656	8,549	21,549
Mississippi	13,445	101,743	44,799	13,256	68,400
Missouri	3,135	3,627	3,962	4,345	8,137
Montana	652	78	429	950	884
Nebraska	2,310	458	209	106	0
Nevada	211	850	513	1	160
New Hampshire	3,989	1,099	3,224	4,276	510
New Jersey	661	538	411	416	376
New Mexico	235	2,231	65	2,624	105
New York	3,971	1,697	4,408	17,896	4,828
North Carolina	4,752	69,085	3,266	23,434	44,067
North Dakota	512	141	44	66	2,940
Ohio	3,264	1,607	5,044	2,512	6,188
Oklahoma	715	1,889	799	432	1,479
Oregon	5,010	21,100	39,055	676	17,000
Pennsylvania	2,773	2,562	3,242	1,804	4,804
Puerto Rico	2,135	605	690	18	422
Rhode Island	217	81	383	240	0
South Carolina	2,969	33,289	4,147	1,466	49,940
South Dakota	122	14	240	1,283	1,397
Tennessee	1,750	3,483	92	2,034	10,500
Texas	2,198	23,601	22,802	5,073	15,157
Utah	374	253	392	510	1,075
Vermont	2,576	314	2,626	4,029	552
Virginia	6,854	51,326	23,815	59,347	68,444
Washington	1,296	7,261	7,595	9,375	11,182
West Virginia	4,593	2,922	1,991	1,646	2,913
Wisconsin	6,899	3,620	3,135	11,515	19,928
Wyoming	113	170	763	365	0
Total	134,338	620,760	293,904	243,377	733,112

1/ Information on assists to loggers and processors, and improved utilization shown in previous Reports of the Forest Service is not available due to inadequate data resulting from a lack of State grants in the wood utilization program.

**Table 59—Works of improvement installed in watershed protection projects—fiscal years 1982-85 and total to date**

	Unit of measure	1985	1984	1983	1982	Total 1954-85
Channel improvement	Miles	2	0	0	0	8.6
Channel stabilization	Miles	2	0	0	0	15
Contour terrace and furrows	Miles	0	0	0	0	916.7
Area treated	Acres	0	0	0	0	1,440.9
Gully control and stabilization	Miles	1	0	0	0	196.1
Grade stabilization structures	Number	0	0	0	0	3,296
Critical area stabilization by tree planting and other measures	Acres	1,014	825	464	490	45,787.8
Forest road and roadbank stabilization	Miles	4.3	1	2.2	38	1,952.5
Area treated	Acres	5	12	2.4	24	5,969.7
Fire roads, trails, and firebreaks and fuelbreaks	Miles	19	19	35.6	28.6	1,695.2
Fire control water developments	Number	0	0	0	0	43
Fire towers	Number	0	0	0	0	8
Intensified fire protection	Acres	313,365	251,999	56,230	10,830	2,953,694
Heliports and helispots	Number	0	0	0	0	42
Mobile fire equipment	Number	2	8	7	0	77
Other fire control improvements	Number	3	1	5	4	471
Radio installations	Number	5	1	0	0	58
Forest watershed management						
Plans prepared	Number	675	748	723	1,052	26,077
Area included	Acres	35,401	39,979	45,129	52,294	2,223,471
Forest stand improvement	Acres	0	0	0	0	1,082,466
Proper harvest cutting	Acres	2,481	6,334	7,463	11,768	555,973
Range and grass seeding	Acres	86	133	12	27	48,608
Tree planting and seeding	Acres	4,753	7,003	6,240	7,653	310,193
Revegetation, surface mined areas	Acres	41	0	1	916	3,463
Woodland thinning and release	Acres	2,527	3,424	3,372	3,387	718,543
Woodland grazing control	Acres	1,137	2,685	3,370	884	298,327
Recreation area development	Acres	966	290	145	753	34,016
Wildlife habitat development	Acres	3,745	6,671	5,910	2,969	49,060
Wildlife ponds	Number	2	2	0	3	86

**Table 60—Works of improvement installed in flood prevention projects—fiscal years  
1982-85 and total to date**

	Unit of measure	1985	1984	1983	1982	Total 1944-85
<b>Structural measures:</b>						
Access road construction	Miles	0	108.5	107	0	375.5
Channel improvement	Miles	0	0	1	0	40.6
Channel stabilization	Miles	0	0	0	1	350.5
Diversion ditches	Feet	0	1,320	0	300	32,097.0
Floodwater retarding structures	Number	0	0	1	0	4.0
Grade stabilization structures	Number	0	0	0	0	1,690.0
Streambank stabilization	Miles	0	0	0	0	11.3
<b>Land treatment measures:</b>						
Critical area stabilization by tree planting and other measures	Acres	1,008	349	1,360	840	336,176.1
Forest road and roadbank Stabilization	Miles	36.8	38.3	34	77.9	2,809.8
Area treated	Acres	456.5	140	206	730	20,646.4
Forest watershed management Plans prepared	Number	484	593	599	1,933	25,650.0
Area included	Acres	27,666	34,935	25,588	56,566	220,924.6
Firebreaks and fuelbreaks	Miles	0	21	36	41	3,466.5
Fire roads and trails	Miles	64	2	46	0	688.6
Fire hazard reduction	Acres	5	6,810	5,479	2,025	27,031.3
Fire water developments	Number	0	1	1	0	187.0
Fire towers	Number	0	0	0	0	46.0
Heliports and helispots	Number	0	0	0	1	461.0
Mobile equipment	Number	0	0	0	0	120.0
Other fire improvements	Number	0	0	0	4	226.0
Permanent radio installations	Number	0	0	0	0	318.0
Proper harvest cutting	Acres	4,733	13,967	7,644	8,674	684,948.0
Forest stand improvement	Acres	0	0	0	0	660,954.0
Tree planting and seeding	Acres	3,130	3,914	1,792	5,841	528,551.0
Woodland thinning and release	Acres	1,865	2,376	1,410	2,669	460,351.0
Revegetation, surface mined areas	Acres	375	351	144	325	8,803.0
Woodland grazing control	Acres	590	60	412	614	191,625.0
Woodland owners assisted	Number	2,425	6,299	8,562	11,297	645,464.0

**Table 61—Forest Research funding—fiscal year 1985 compared to 1981-85 average**

	Actual	1985 RPA 1,000 constant	1981-85 average 1/ 1985 dollars 2/	Percent of actual to average
Appropriated funds:				
Land and resource protection research:				
Fire and atmospheric science	7,963	15,760	9,127	87
Forest insect and disease	21,147	40,089	23,292	91
Forest inventory and analysis	17,133	24,684	14,790	116
Renewable resources economics	4,513	10,314	5,263	86
Renewable resources management and utilization research:				
Timber management	22,161	40,278	23,090	96
Watershed management and rehabilitation	11,229	23,800	12,068	93
Wildlife, range, and fish habitat	9,108	20,405	9,713	94
Forest recreation	2,084	6,713	2,290	91
Forest products and harvesting	18,488	35,663	20,291	91
Special projects, Competitive grants 3/	(7,840)	-- 4/	(1,568)	500
Subtotal	113,826	217,706	119,924	95
Research construction	1,634	15,039	1,341	122
Total, appropriated accounts	115,460	232,745	121,265	95
Reimbursable accounts	5,159	--	4,995	103
Grand total	120,619	232,745	126,260	96

1/ In order that a comparison may be made with 1982-85, general administration has been eliminated from individual line items in calculating the average. Total appropriated general administration funds are included in the "General Administration" line item on tables 10 and 11.

2/ Survey of Current Business (BEA) index values used for 1981-84. BEA updates GNP implicit price deflators periodically. These are current of December 1985.

3/ Funds transferred to the Office of Competitive Grants included here as a non-add item.

4/ -- = not reported in the RPA.

**Table 62—Forest Research funding—fiscal years 1981-85**

	1985	1984	1983	1982	1981 1/
	<u>1,000 dollars</u>				
Appropriated funds:					
Land and resource protection research:					
Fire and atmospheric science	7,963	7,783	8,484	9,014	8,600
Forest insect and disease	21,147	22,129	21,577	20,942	21,283
Forest inventory and analysis	17,133	12,128	12,337	13,332	13,292
Renewable resources economics	4,513	4,748	4,979	4,841	5,055
Renewable resources management and utilization research:					
Timber management	22,161	22,137	20,585	20,710	20,705
Watershed management and rehabilitation	11,229	11,242	10,961	11,400	10,678
Wildlife, range, and fish habitat	9,108	9,163	8,706	9,334	8,395
Forest recreation	2,084	2,085	2,146	2,150	2,060
Forest products and harvesting	18,488	17,988	17,897	20,422	18,385
Special projects, competitive grants 2/	(7,840)	0	0	0	0
Subtotal	113,826	109,403	107,672	112,145	108,453
Research construction	1,634	422	454	388	3,092
Total, appropriated accounts	115,460	109,825	108,126	112,533	111,545
Reimbursable accounts	5,159	5,192	3,563	4,545	4,570
Grand total	120,619	115,017	111,689	117,078	116,115

1/ In order that a comparison may be made with 1982-85, general administration has been eliminated from individual line items. Total appropriated general administration is included on tables 10 and 11.

2/ New account in 1985.

**Table 63—Extramural research funded through the Forest Service—fiscal years 1984-85**

Type of recipient	1985		1984	
	1,000 Dollars	Number of grants	1,000 Dollars	Number of grants
Domestic grantees:				
Universities and colleges:				
Land-grant research institutions	4,123	225	5,408	313
S&E-CR <u>1/</u>	162	3	225	3
1890 Land-Grant and predominantly Black institutions	114	5	181	9
Other non-Land-Grant institutions	2,224	92	1,201	62
S&E-CR <u>1/</u>	--	--	50	1
Subtotal, universities and colleges	6,623	325	7,065	388
Other domestic:				
Industrial firms	--	--	--	--
Profit organizations	5	1	34	3
Nonprofit institutions and organizations	149	8	134	8
Federal, State, and local governments	315	20	207	12
Private individuals	69	5	137	13
Small business innovation research	302	11	52	4
Subtotal, other domestic	840	45	564	40
Total, domestic	7,463	370	7,629	428
Foreign grantees:				
Universities and colleges	14	2	24	3
Government agencies	--	--	--	--
Nonprofit institutions and organizations	--	--	20	1
Private individuals	1	1	1	1
Total, foreign grantees	15	2	45	5
Grand total	7,478	373	7,674	433

1/ Grants executed by Science and Education-Cooperative Research with Forest Service Accelerated Pest Program funds.

**Table 64--Research publications by major subject area--fiscal years 1982-85**

	Number of publications			
	1985	1984	1983	1982
Environmental Research:				
Watershed management	154	95	168	130
Wildlife	136	138	134	136
Range	64	88	101	50
Fisheries habitat	18	37	28	21
Forest recreation	69	59	87	60
Urban forestry	36	25	41	23
Disturbed areas rehabilitation	34	40	39	19
Atmospheric deposition and air pollution	35	24	15	11
Subtotal	546	495	598	439
Insect and Disease Research:				
Insect detection and evaluation	69	30	13	78
Insect biology	94	138	107	79
Insect control and management strategies	119	102	119	103
Disease detection and evaluation	51	10	8	21
Disease biology	45	55	85	78
Disease control and management strategies	37	48	48	32
Mycorrhizae	50	26	23	34
Wood products organisms	24	23	37	22
Subtotal	489	443	455	458
Fire and Atmospheric Sciences Research:				
Fire prevention, hazard reduction, and prescribed burning	19	11	18	24
Fire management methods and systems	25	27	37	24
Forest fire science	23	8	23	14
Ecological relations	35	19	27	16
Weather modification and weather effects	35	30	32	28
Subtotal	137	95	137	106
Timber Management Research:				
Forest biology	109	130	117	73
Silviculture and management	196	293	247	227
Growth and yield <sup>1/</sup>	68	--	--	--
Genetics and tree improvement	100	89	104	82
Subtotal	473	521	488	393

See footnote at end of table.

**Table 64—Research publications by major subject area—  
fiscal years 1982-85—Continued**

	Number of publications			
	1985	1984	1983	1982
Economics and Marketing Research:				
Forest resource evaluation	110	119	99	92
Forest economics	182	142	128	122
Subtotal	292	261	227	214
Products and Engineering Research:				
Forest engineering systems	84	66	50	38
Wood engineering	52	43	53	49
Chemistry, fiber, and fuel products	59	84	91	72
Utilization potential and processing of wood	133	126	130	98
Protection of wood in use	13	24	13	14
Subtotal	341	343	337	271
General	21	31	17	28
Grand total	2,299	2,189	2,259	1,909

1/ This subject area was not reported separately prior to 1985. In earlier years, publications were reported elsewhere in Timber Management Research.



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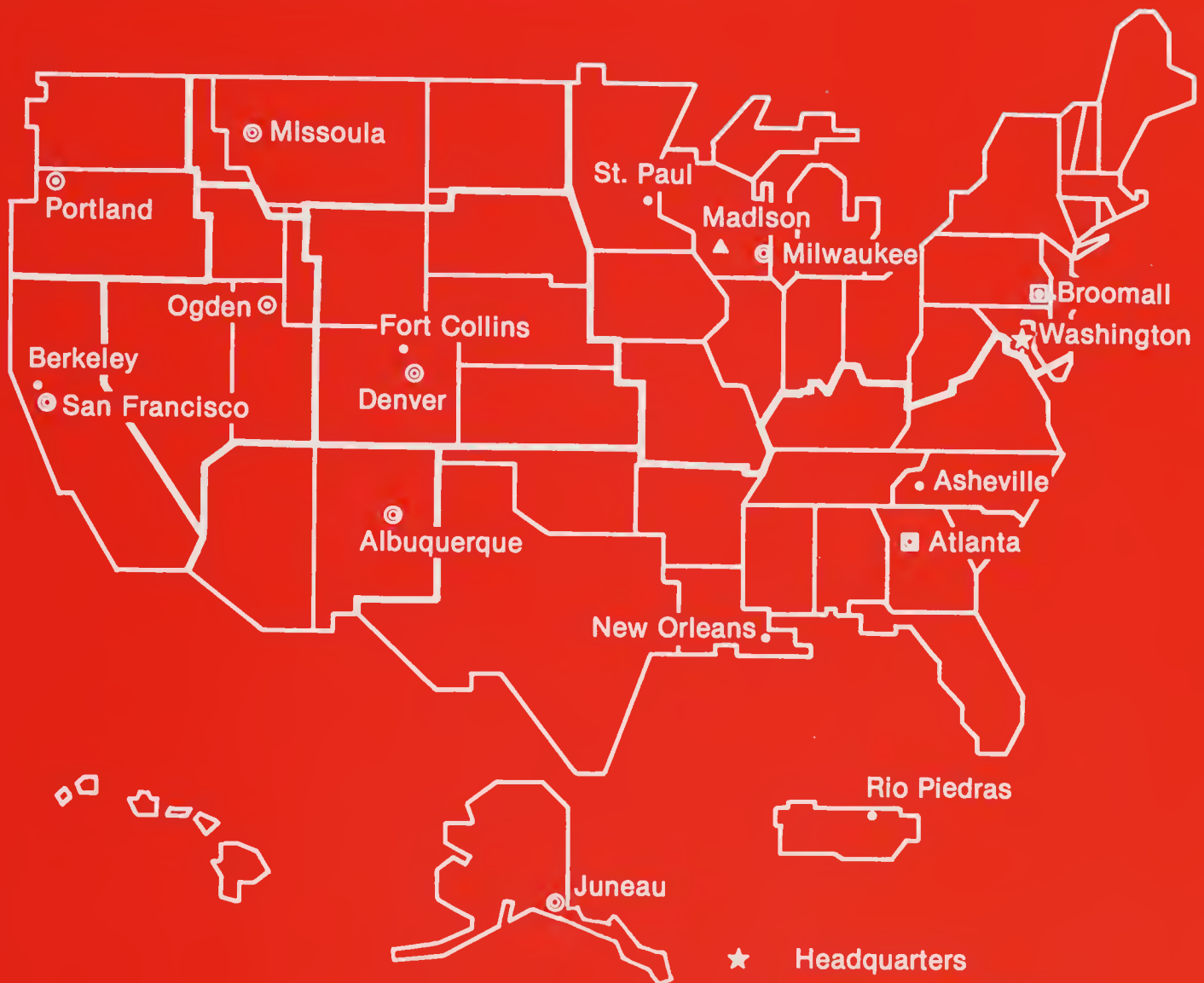
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**The Forest Service**  
United States Department of Agriculture



- ★ Headquarters
- Regional Boundaries
- ⊙ Regional Headquarters
- Forest and Range Experiment Station Headquarters
- ▲ Forest Products Laboratory
- State and Private Forestry Area Headquarters

(In other Regions S.&P.F. activities are directed from Regional headquarters)

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